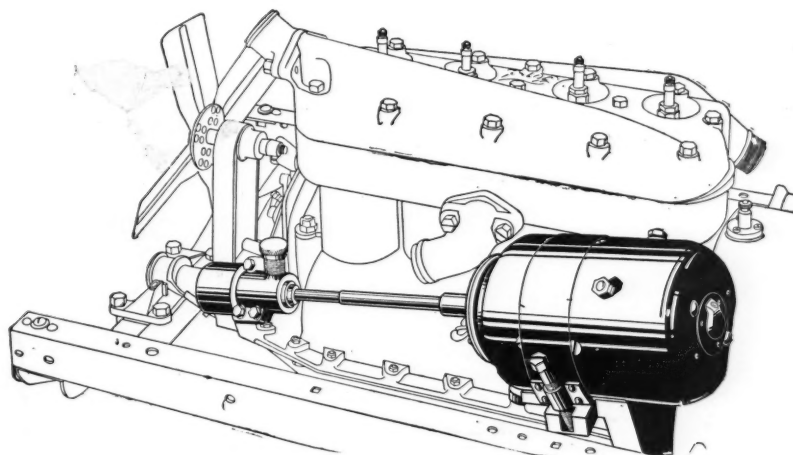


MOTOR AGE

Vol. XXIX
No. 4

CHICAGO, JANUARY 27, 1916

Ten cents a copy
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The New Shaft Drive Genemotor

Trade Mark

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Two laps made at 76.75 miles per hour.

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MOTOR AGE

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No. 4

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The season just closed has justified the wisdom of my choice, both by the volume of business, and in the satisfaction of dealing with the **RIGHT** company.



MOTOR AGE

Window Shopping at the Show



By J. C. Burton

HE saw me bobbing about in the maelstrom of anticipation, in the crowd that was surging around the main entrance of the Coliseum and jostling the slow seconds into flight. In ten more minutes, the doors would open and the sixteenth annual Chicago motor show would be on.

With a Mahin-like plunge, he bucked his way through the throng and slapping me on the back, exclaimed with enthusiasm:

"Some crowd! I've seen 'em lined up here to give Alice Roosevelt and Teddy, the I himself the once-over but nothing like this. When Barnum and Bailey was featuring Diavolo and showing here, they never played to an opening day crowd like this. The honk of the horn sure brings 'em out. If it wasn't January, you'd think the Giants and Athletics was playing the deciding game of the world's series."

Meets a Former Pal

It was the pal of many of my previous perambulations, Breezeaway Faye, who 5 years ago proved that fact is stranger than Horatio Alger fiction. He was a former runner on the board of trade who woke up one morning to see his name on the front page of all the newspapers where before

he could not have found it in the city directory without a microscope. He had played one of his many hunches and for once, it had paid. He had parleyed a shoestring into an obese bankroll.

The Four-Bit Look

"And they're all here, waiting to give the 1916 models the four-bit look," he continued. "I've assayed the crowd and it don't average one buyer out of every twenty people. There's Brass Buttons Bob, the elevator starter at the Masonic Temple; Tony, the Greek bootblack at the corner of State and Madison; O'Rourke, the crossing cop; and Big Dutch, one of the waiters at the Cafe du Lac. Wilson will have writer's cramp before they get enough kale to buy a car, but they're all on the job to-day. They're here for an afternoon of window shopping."

"Window shopping?" I asked. "I don't get you. What is window shopping?"

Breezeaway looked upon me as a movie star looks upon a supe, surprised at my ignorance, and then volunteered the following definition:

"Window shopping, according to the

women, is the king of outdoor sports. Whenever a woman gets down town and has 2 or 3 hours and no money to spend, she goes window shopping. She gives the Poirer gowns and the thousand dollar furs the double O and then kids herself into believing she'd look like Lillian Russell or Beverly Bayne if she had 'em on. It's great for developing the imagination and one of the great secrets of conserving the bankroll. I'm going window shopping at the show myself.

"Perhaps you're not wise to the fact that there's a lot of guys in this world that indulge in all the joys of motoring without suffering any of the expense. They're like the rocking chair sailors, who cruise the seven seas in storm and calm while seated on the veranda of the yacht club. Give 'em a Blue Book and a quiet evening by the fireside at home and they'll get so enthusiastic over their tour that before going to bed, they'll wash the dust out of their hair and put cold cream on their hands and face to keep from getting sunburnt. The window-shoppers and the fireside motorists all belong to the same family. You can write your own ticket that Big Dutch, the waiter, will spend over a million here this afternoon. He won't fall for any low-priced wagon. When it comes to window shopping, Big Dutch, like all window shoppers, is no piker. He'll spend until his imagination gets paralysis."

The Magic Hour Arrives

My loquacious companion looked at his watch, the hands of which pointed to two o'clock.

"I wonder what they're waiting for!" he asked petulantly. "The salesmen have had all morning to shine up their diamonds and get their trousers pressed. Maybe one of the ballyhoo artists found that the dress suit he rented didn't fit and sent back for another."

There was a rattling of bolts as the doors swung open and the gatemen started their monotonous chant. There was a shuffling of feet and a mighty shove as the crowd behind us forced its way to the ticket windows. A hand reached through the throng and snatched our tickets. Another push and we were past the door. The 1916 motor show had received



"I wonder what they're waiting for?" Breezeaway asked petulantly. "The salesmen have had all morning to shine up their diamonds and get their trousers pressed"

us and hundreds of other window shoppers.

From a high loft over the balcony on the north side of the Coliseum came cymbal-clanging, reed-piped Japanese music, a se-

lection from Puccini's opera, "Madame Butterfly." Over the entire ceiling billowed a gorgeous canopy, on which had been painted the flowering branches of cherry trees, the quaint pergolas and the high pointed towers of the realm of the mikado. The glare of the arc lights was softened by clusters of cherry blossoms. Huge illuminated columns and monumental arches formed a background of light and color for the exhibits.

"I singa hi, singa lee, singa low,
That means I want to go to Tokio"

hummed Breezeaway and then he added:

"A swell set for a Japanese juggling act or a troupe of slack wire walkers! Wonder where Fan Tan and High, Low, Jack and the Game and Deuces Wild are? Suppose they couldn't get away from Gilbert and Sullivan's 'Mikado' although I didn't know it was playing now that DeWolf Hopper had gone into the movies. Makes you kinda thirsty for a nip of tea, don't it?"

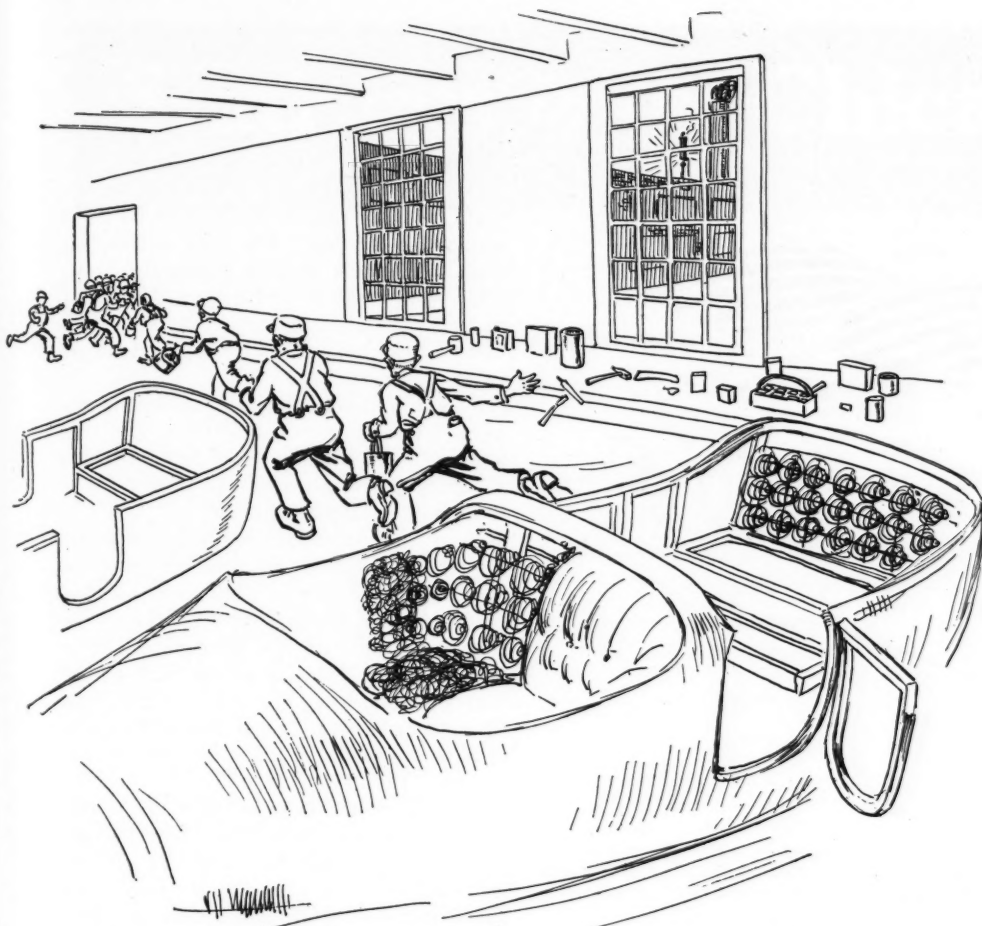
Orange-Color Attracts

We walked down the outside aisle of the Coliseum until we came to the Case booth. There we stopped. We couldn't help it. Our attention and progress were arrested by a touring car, painted a bright orange and finished in black and white striped upholstery.

"If any salesman tells you that that boat is an all-year-round car, you inform him that he's elected to membership in the Ananias club," Breezeaway declared. "You might be able to drive it 364 days of the year but not on March 17, not with the sons of old Erin having a monopoly on the traffic cops' jobs in this fair city. What a unique means of committing suicide it would be to take that machine out for an airing on St. Patrick's day. I bet



"You might be able to drive that orange Case 364 days of the year, but not on March 17. What a novel means of committing suicide it would be to take that machine out for an airing on St. Patrick's day. I bet they call it the A. P. A. model"



One of the new aluminum Marmons, which looked as if the assemblers had suddenly quit work on it when the 5 o'clock whistle blew, attracted our attention. "A study in motor car anatomy," Breezeaway explained, "and tangible proof that the maker has no moustache or anything up his sleeves to deceive you"

they call it the A. P. A. model. It's a beautiful job of painting. Finley Peter Dunne should show it to Mister Dooley. He's the only man I know of that would fully appreciate it. He'd applaud it with a brick. That might be classed as a motor car on any other day than March 17. Then it would be a tumbrel."

And because our eyes are weak, we left the resplendent Case and sought a booth where cars, like good little boys, could be seen and not heard. One of the new aluminum Marmons, which looked as if the assemblers had suddenly quit work upon it when the 5 o'clock whistle blew, attracted our attention.

An Anatomical Study

"A study in motor car anatomy," Breezeaway explained, "and tangible proof that the maker has no moustache or anything up his sleeves to deceive you. Observe there are no knots in the wood of which the back of the seat is made and kindly count the layers of padding and feel the quality of the leather in the cushions."

"In window shopping at a motor show, stripped chassis make little hit with me. They remind me of chorus girls without their makeup on."

Again we wandered on in search of a car that viewed in the looking glass of our imaginations, would become our particular style of pulchritude.

"I have a purchaser for that car," cried Breezeaway, pointing to the feature exhibit in the Paige-Detroit booth, a special creation of black and white stripes running vertically. "Francis X. Bushman" is his name. He loathes ostentation of any kind. He is modestly personified. I read only yesterday that he has a lavender town car that is manned by chauffeur and footman in lavender livery and that he smokes cigarettes stamped with his monogram in lavender and scented with lavender perfume.

"They should call that car the Sing Sing model. If the stripes ran the other way, a convict could make his getaway in it without being detected. The prison guards would think he was part of the cushions."

My companion felt of the material of which the seat and cushions were made, reflected for a moment and then exclaimed:

"They must have gone to a great expense in securing the zebra hides to upholster that car. I suppose that soon all the makers will be fitting out armed expeditions and sending them to Africa to hunt the striped horse. It would not surprise me a bit to learn that Paul Rainey is on the engineering staff of the Paige company."

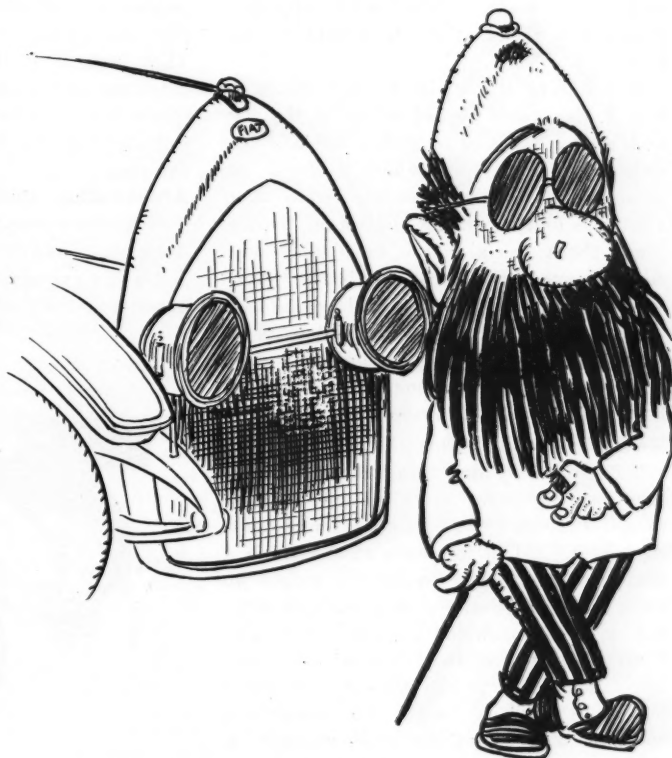
Tacks to Another Booth

We looked down the center aisle of the Coliseum and saw a great crowd gathered about the Studebaker booth.

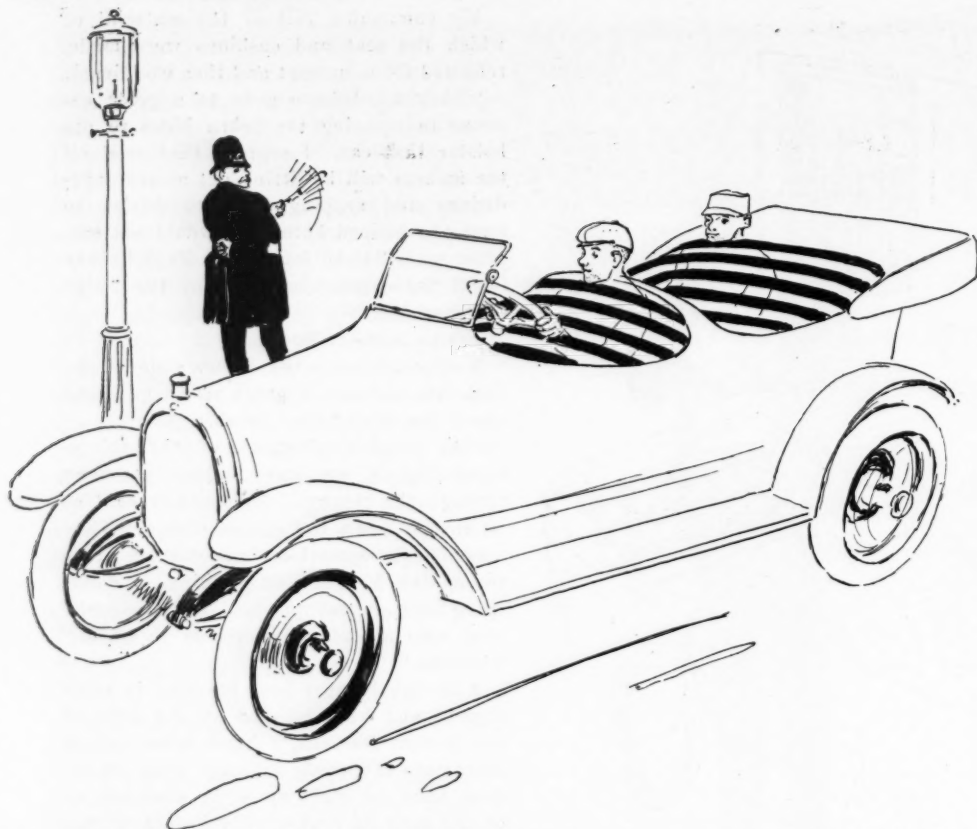
"As window shoppers of the thirty-third degree, we must elbow our way through the throng," Breezeaway said as he rushed down the center aisle. "They must have something exceedingly rare there, like 1 gallon of gasoline, or something most commonplace, like the pancake chef who attracts the crowds to Childs' windows."

Although I never have traveled in polar regions and been blinded by the light of the Aurora Borealis, I know what optical sensations the arctic explorer must experience when he looks upon the phenomenon of the land of snows. For before us was the famous gold chassis, built at a cost of \$25,000, a chassis that none but a Rockefeller could afford, but because of its prohibitive price, having a special charm for window shoppers such as we.

"They should pass around smoked glasses with this exhibit," was Breezeaway's comment. "And I don't see Tiffany's name on it anywhere. Sherlock



The radiator of the Fiat looks as if Goldberg, the cartoonist, had designed it; as if it had been patterned after one of the characters in the "Foolish Questions" series. The contour of the radiator top and the dome of the head are the same



"They should call that car the Sing Sing model," Breezeaway declared on seeing the feature exhibit in the Paige booth. "If the stripes ran the other way, a convict could make his getaway in it without detection. The prison guards would think he was part of the cushions"

Holmes should be here to guard it. Perhaps he is but has stepped out for lunch.

"Take it from me, it is a most regal display. Notice the purple velvet on which the wheels rest and purple silk cords to prevent the touch of plebeian hands. If I owned such a car, I would send uniformed trumpeters ahead of me to herald my approach."

But before we made up our minds to buy it, the crowd pushed us out of the way and we were forced to seek other and less dazzling objects upon which to focus our gaze. Over in one corner were four Packards and a twin-six chassis on display. I say there was a chassis on display with some reserve, for I didn't see it. A crowd was gathered that seemed to have no idea of passing on. The cars were splendid examples of the master body-builder's skill and as luxurious in fittings as the town house of a multimillionaire.

He Lacks Coat of Arms

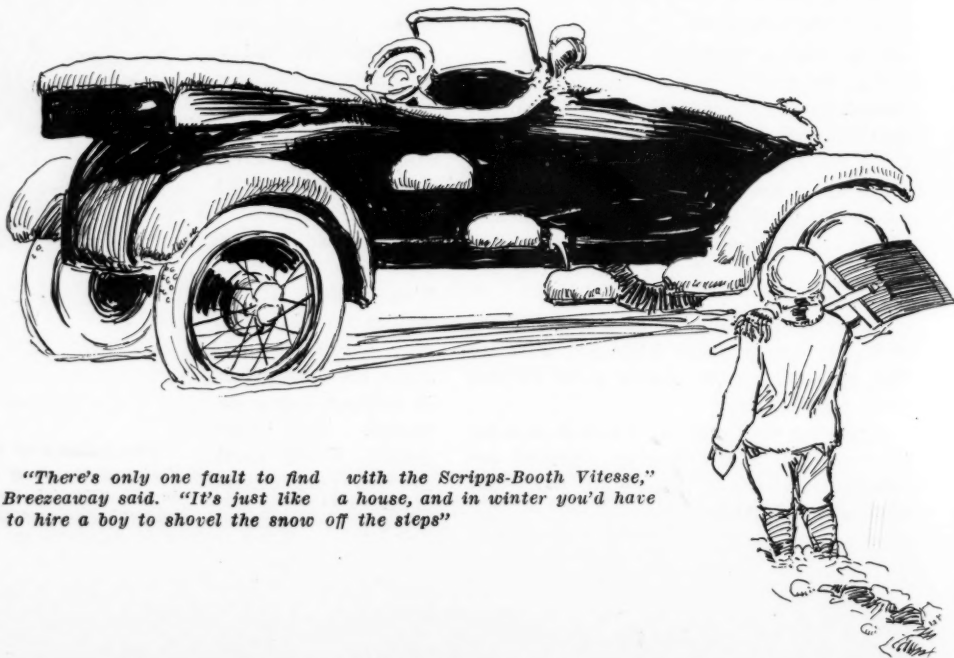
"There's only one thing that keeps me from putting in an order for one of those cars," Breezeaway declared after inspecting them. "I'm not sure that there's a coat-of-arms in my family. I would no more think of driving such a machine without my crest enameled upon the door than I would of seeing the 'Follies' from any but a seat next to the runway. It can't be done. There must be something couchant and something else rampant on the door."

Close by the Packard booth was the Velie exhibit, consisting of a red touring car, a white roadster and a blue coupe.

Breezeaway volunteered the suggestion that they be purchased by the United States army and used to chase Mexican bandits. We also admired the lines of the Fiats, which because of their massiveness give the impression of power. My companion was of the opinion that Goldberg, the cartoonist, designed the radiators. They look as if they had been patterned after one of the characters in the "Foolish Questions" series. The contour of the radiator top and the dome of the head are the same.

A Four-Ring Show

"This is a four-ring show," Breezeaway declared, "and we've only seen one ring. Let's hide ourselves to the First Regiment armory and see what awaits us there."



"There's only one fault to find with the Scripps-Booth Vitesse," Breezeaway said. "It's just like a house, and in winter you'd have to hire a boy to shovel the snow off the steps"

The armory, like the Coliseum, had been transformed into a Japanese garden. The same opportunities for window shopping were offered there as in the larger building. Here was the Scripps-Booth exhibit, featured by the Vitesse model, a car that looked like the salesman was telling the truth when he said it would show 55 miles an hour on second. The horn, protruding from the scuttle dash in steamship ventilator style, made an awful hit with both of us and the only fault we could find with the car was that it had steps instead of running-boards.

"That would add to the expense of upkeep," Breezeaway said. "It's just like a house. In winter, you'd have to hire a boy to shovel snow off the steps."

A Splotch of Brilliant Color

Then his attention suddenly was attracted to a splotch of brilliant color on the background of soft tints, a car painted the shade of a burning haystack, as red as the gown worn by the adventuress of a Drury Lane melodrama or the back of Ed Walsh's neck when the score is tied, the bases loaded and he is pitching to Ty Cobb or Sam Crawford. I know of nothing redder than that.

"You wouldn't have to tell a blind man what color this car was," said Breezeaway, pointing to the calorific model, a clover-leaf roadster with a Pathfinder nameplate on its radiator. "He could hear it. And if he couldn't trust his hearing, he could put his fingers on it and learn the lesson that little children are taught, that they shouldn't play with fire."

"But it's some car," he added after inspecting it carefully. "Some car. Got lines like a Zeigfeld chorus girl. Built like a modern six-room apartment, too, with wall safe for the cigarets and other valuables," and he pointed to the compartment in the cowl and the sides of the tonneau that lock with a key.

"What do you say we buy that boat and get off this window shopping thing."

I acquiesced readily and together we went out of the show, got into our car—a Through Route, No. 3—and went down town.

Statistics of the Chicago Show

Eighty Makers of Gasoline Cars Exhibit 294 Chassis—New York Outdone in Several Respects—Japanese Decorations Effective—Record Attendance Expected

COLISEUM, Chicago, Jan. 22—When the clock struck two today, the starter pedal was depressed, the clutch thrown in, the spark advanced and the western debut of the 1916 debutantes began in the soft light of a Japanese garden. After the first few minutes taken in getting the perspective, one paused to compare the fete with others of its kind preceding it. Naturally, the event was weighed first with the New York show of 2 weeks ago.

Taking first the gasoline cars it is found that eighty makers of this class of cars are represented as compared with seventy-nine at Father Knickerbocker's party. Two hundred and ninety-four chassis are on display at the Chicago show as against 307 at New York, these being divided in such a way that the six-cylinder types lead with 135, the four-cylinders ranking second with 106 and the eights and twelves numbering forty-two and eleven respectively. New York had 136 sixes, 108 fours, thirty-nine eights and thirteen twelves. Of the 209 chassis shown at the Chicago show, fifty-two are stripped.

Two Hundred Forty-Two Body Types

Two hundred and forty-two body types are shown. Of these 187 are open cars, sixty-five being five passenger, fifty-seven six and seven-passengers; thirty-three two passenger; twenty-three three-passenger and ten four-passenger. In the closed car group fifty-five models are exhibited, seven being coupes, ten sedans, eighteen demountable tops—these include two-, three-, four-, five- and seven-passenger capacities—ten limousines, one landaulet, five town cars and two berlines. Putting these figures in the balance with New York, Chicago leads in the touring car class of exhibits by four, in demountable tops by three, in coupes by one, and in berlines by one. New York was ahead of Chicago in roadster types, having seventy-seven as against Chicago's sixty-six. In the cabriolets New York had five—a lead of three—in limousines, eleven—a lead of one—in landaulets, three—a lead of two. In the town car types they were even, each having five.

Thumbing the pages of history, turning to a year ago at Chicago, it is shown that there are forty more gasoline cars on display today than there were at the 1915 show. One hundred and thirty-three fours

How Exhibits Were Divided

| | |
|-------------------------------------|------|
| Number of manufacturers exhibiting. | 80 |
| Total number of chassis exhibited. | 294 |
| Number of four-cylinder motors. | 106 |
| Number of six-cylinder motors. | 135 |
| Number of eight-cylinder motors. | 42 |
| Number of twelve-cylinder motors. | 11 |
| | —294 |

BODY TYPES—OPEN CARS

| | |
|-------------------------|------|
| Five-passenger | 64 |
| Six and seven-passenger | 57 |
| Two-passenger | 33 |
| Three-passenger | 23 |
| Four-passenger | 10 |
| | —187 |

BODY TYPES—CLOSED CARS

| | |
|------------------|-----|
| Coupes | 7 |
| Sedans | 10 |
| Demountable tops | 18 |
| Cabriolets | 2 |
| Limousines | 10 |
| Landaulets | 1 |
| Town cars | 5 |
| Berlines | 2 |
| | —55 |

| | |
|-----------------------------|------|
| Number of stripped chassis. | 52 |
| | —294 |

| | |
|---------------------------|----|
| Makers using wire wheels. | 32 |
| Houk | 23 |
| R.-W. | 4 |
| F. & H. | 2 |
| Universal | 2 |
| Spangler | 1 |
| Makers using cord tires. | 16 |
| Goodrich | 10 |
| Goodyear | 6 |

Decorations at the Show

HAD a section of the Nipponese Empire been picked up bodily and brought to Chicago to form the floor, wall and overhead scheme, the effect could hardly have been less impressive. The several doors leading from the main entrance to the Coliseum often were choked with open-eyed—and sometimes open-mouthed—spectators, who paused for an inspection, ranging from casual to close, of the stage setting for Chicago's sixteenth annual show. Then as the visitors stood and wished themselves in Japan, where such surroundings, without the new cars, of course, are common, they were swirled along by the every increasing crowds flowing in from Wabash avenue.

In all four buildings—the Coliseum, the Annex, the Armory and the Greer building—the same scheme was carried out as far as possible. Through the center of the Coliseum were two rows of lattice-work, topped with pagoda-like cornices. The lower sections of the lattice represented growing bamboo, while in the upper part were entwined Japanese cherry blossoms.

Both sides of the center aisles each way were marked off with copings representing continuous miniature pagodas, while jardinières filled with cherry blossoms and ferns separated the exhibits at other points. The balconies were fitted with panels, depicting Japanese mountain and water scenes, Geisha girls, birds and animals, while over the top of the half-cylindrical roof of the Coliseum stretched oriental shrubbery, bamboo, and the roofs of pagodas until they nearly met at the top. Work was begun on the decorations last September and the cost was between \$100,000 and \$125,000.

were shown last year, as against 106 this year. Six-cylinder models show a material gain over last year, when only 110 were exhibited, compared with 135 this year. As an evidence of the gain in popularity of the eight it may be said that there are forty-two chassis being shown whereas, only eleven were at the 1915 show. Of course, the twelves, being a 1916 development, no comparison is possible with other years.

More touring cars were displayed at the 1915 show than are to be found on the floors of the Coliseum, Greer building and Armory today, although the difference is but one. Of the roadsters there were only forty-two last year, compared with sixty-six this year, but this is accounted for largely perhaps by the fact that three and four-passenger bodies come under roadsters this season. In the other body types little difference is to be found in numbers as between the 1916 and 1915 shows.

The use of wire wheels seems to be on the increase, since thirty-two makers out of the eighty represented here are showing some, if not all, models so equipped.

Cord tires are found on some of the models among 20 per cent of the manufacturers showing at Chicago. These are not stock on all models of all the makers exhibiting them, but are found predominating among sixteen separate exhibitions at the Chicago show.

Attendance Promises Record

Chicago, Jan. 25—A new record for attendance probably will be set if the figures for the first 2 days of the show can be taken as a criterion. No doubt weather conditions have done much to bring out the crowds.

Saturday, the opening day, saw between 30,000 and 35,000 visitors, while yesterday approximately 50,000 attended. Tomorrow is society day and a record crowd is expected. Manager Miles estimates that when the final curtain has been rung down next Saturday night, 350,000 will have viewed the new models at the Chicago show. This will represent a gain over last year of between 30 and 35 per cent. When it is taken into consideration that the attendance at the New York show, just closed, was only 250,000, it seems probable that Chicago is likely to eclipse the metropolis in the matter of visitors.

Flashing the

How the northeast corner of the Coliseum appears from the balcony. Here the ornate Nipponese decorations are clearly shown. The pillars embody the myriad oriental colorings set off by lights from inside

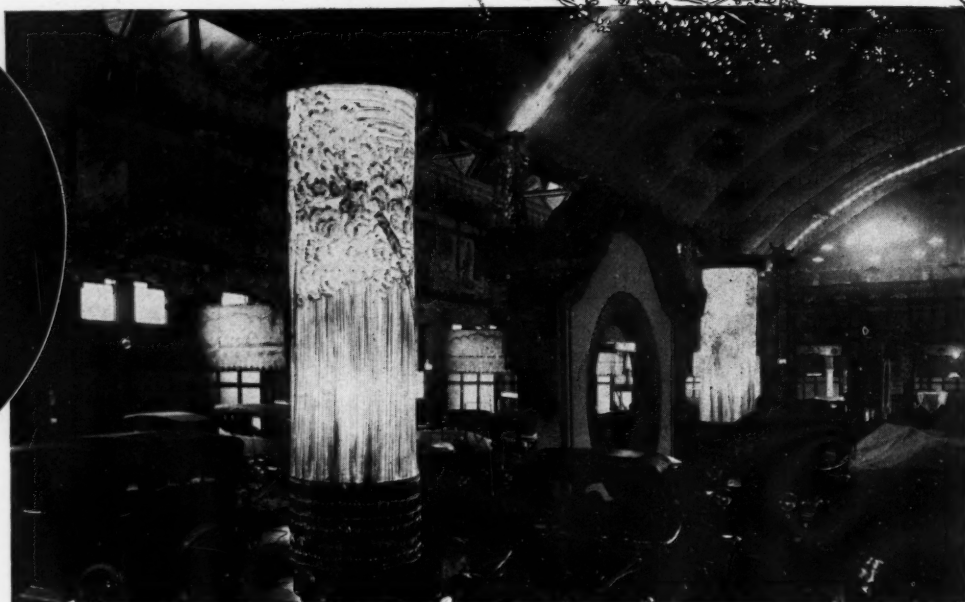
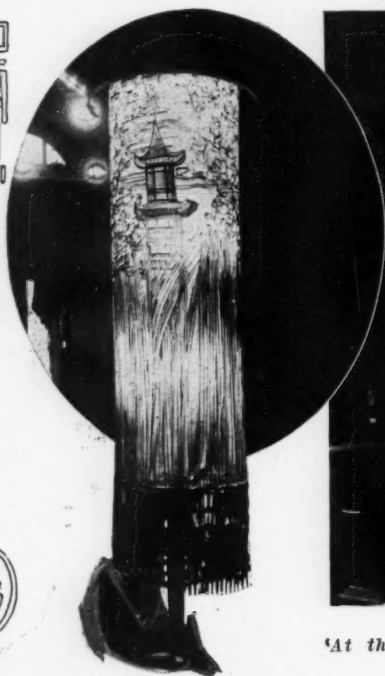
Looking south down the main aisle of the Coliseum from a point directly in the center of the building. Again, in this view the Japanese effect is shown. Note the panels in the balconies

Chicago Show

Studebaker gold chassis in foreground and Willys-Knight chassis across from it. This is one of the spots that manufacturers vie for at the annual drawing



Looking north up the main aisle. Note the pagoda copings and the receptacles filled with cherry blossoms and ferns marking off the exhibits



At the left is a close-up study of one of the interior-lighted pillars at the show and at the right a more general view showing how they were placed



Note the Nipponese atmosphere lent to the accessory spaces up above the main floors. The tent-like covering overhead was of vari-hued strips

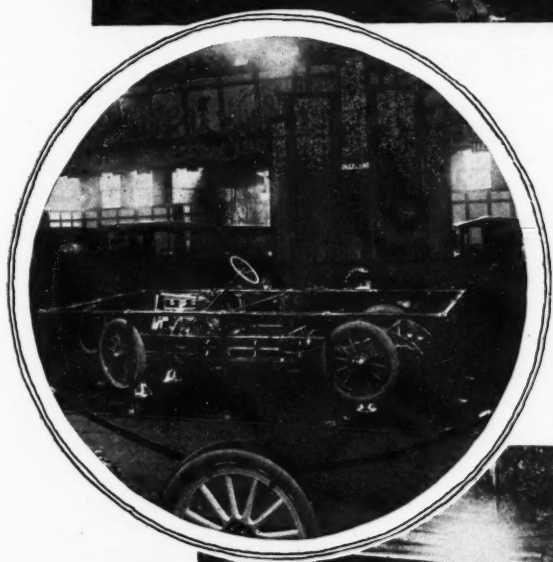
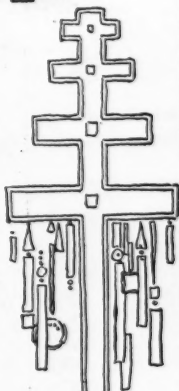
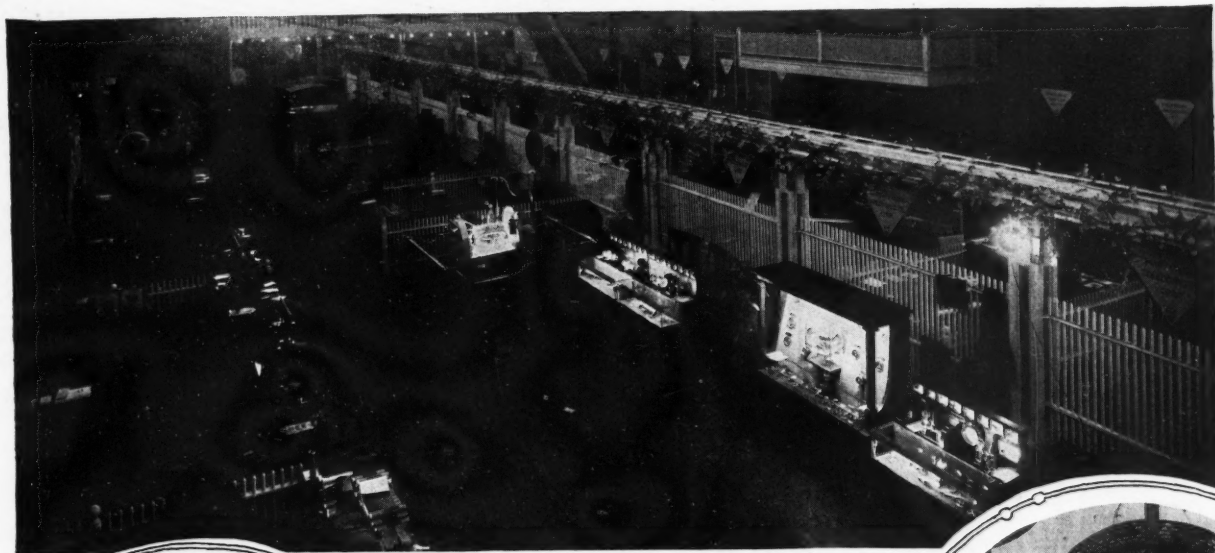


Some of the panels that inclosed the balconies. On these were various Japanese scenes

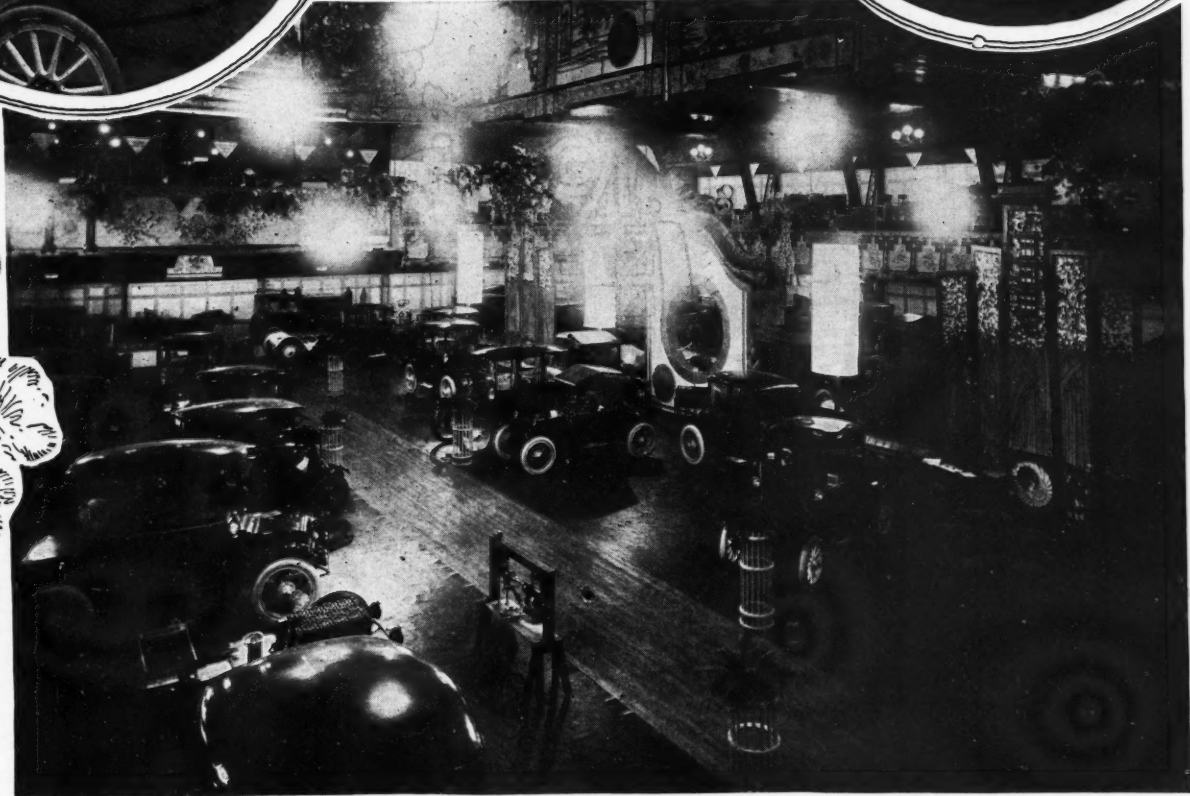
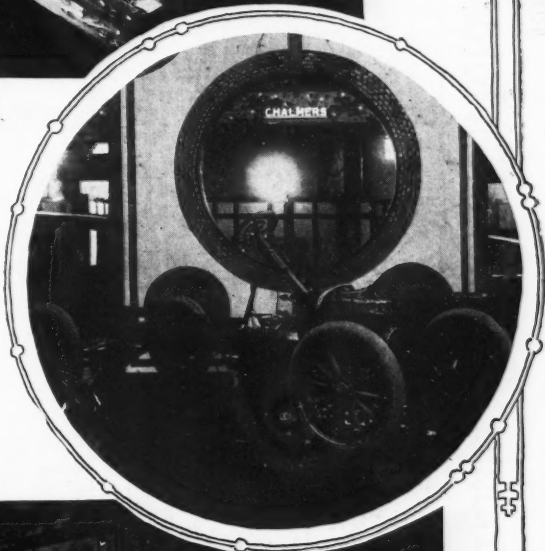


A close view of the ceiling decorations, the light behind which brought out the color schemes very effectively

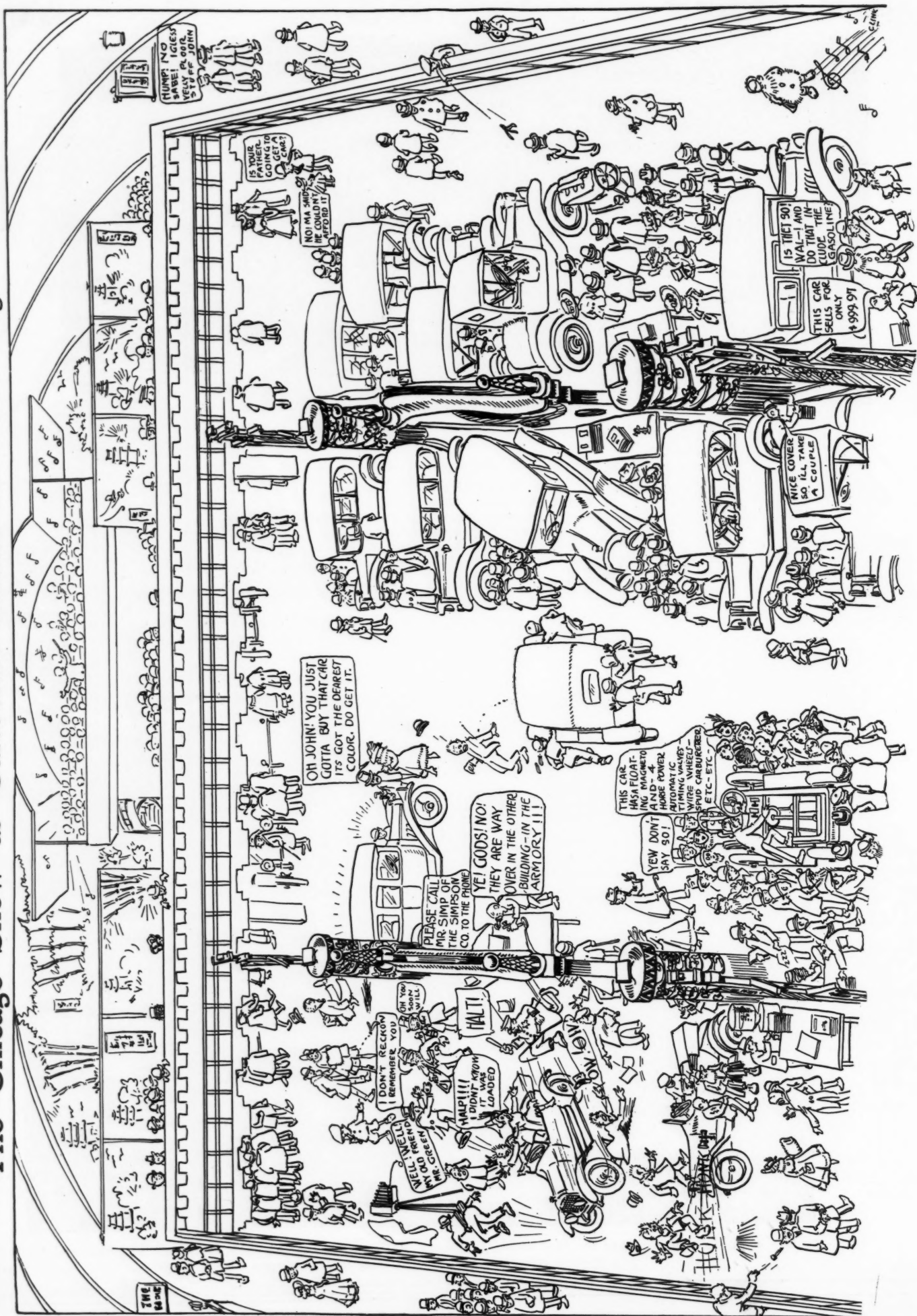


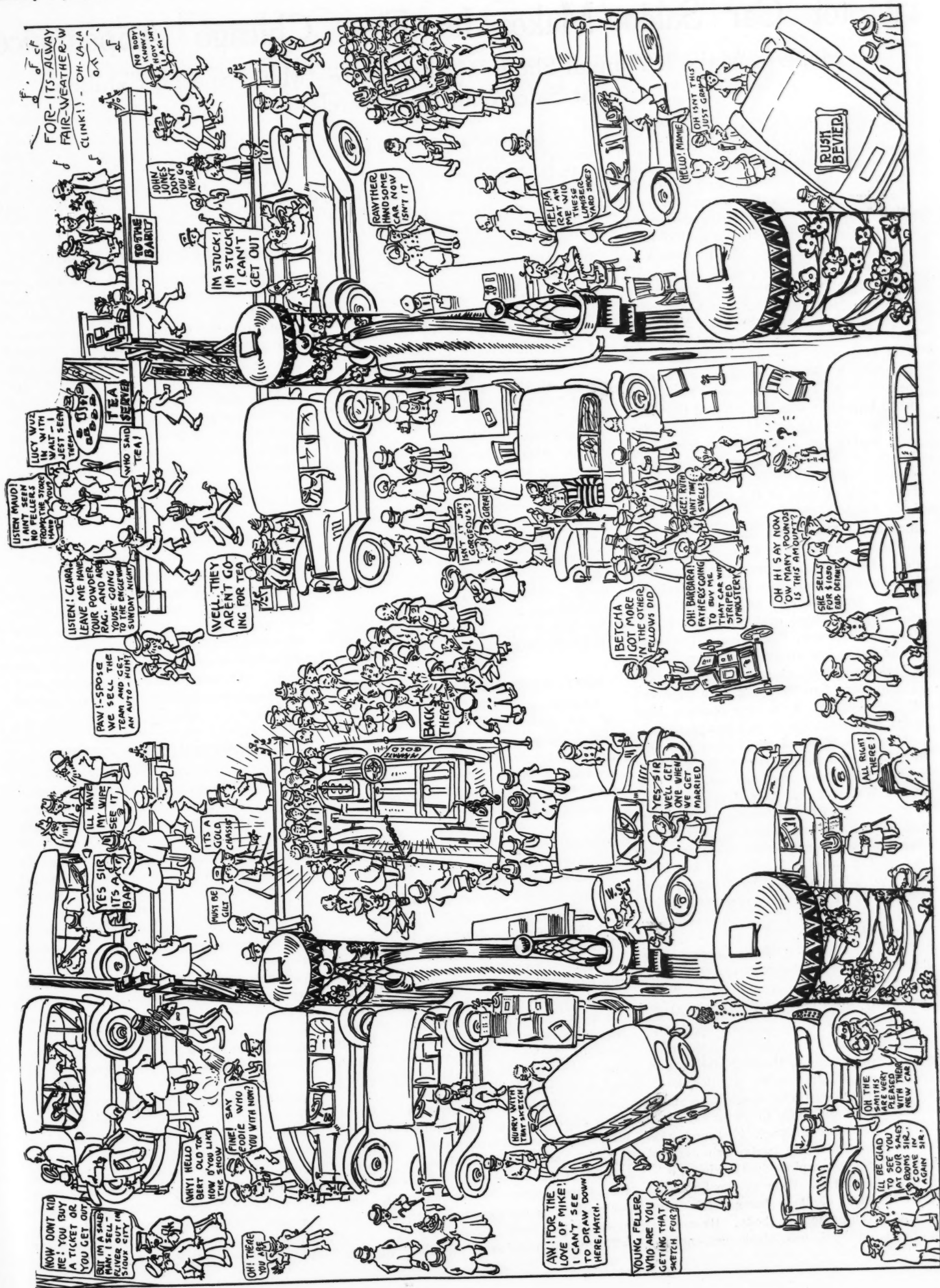


Top—This gives an idea of the double aisle effect gained in the end of the balcony where the accessory exhibitors held forth. Left—View of the Willys-Knight stripped chassis. Right—Section of the Chalmers booth showing stripped chassis



Looking down the middle aisle of the First Regiment Armory, where the electric cars were exhibited. Note that the decorations follow the same plan as those in the Coliseum





Motor Car Salon Makes Its First Chicago Appearance

Hope to Make It Annual Show Week Feature—Many Special Exhibits at Salesrooms and Hotels

CHICAGO, Jan. 24—A new thing in Chicago motor car circles is the Salon which opened this afternoon at the Auditorium Hotel. Although such an exhibition has been held for several years in New York at the Astor during show week, this is the first year that a similar affair has been staged here. The promoters are confident of the success of the venture, and seemed well pleased with the number of visitors during the opening hours today.

In former years the Salon of New York has been called the Importers' show, but this year with war occupying the minds of nearly all Europeans little new has appeared from across the seas. Hence the word Importers was left off, and the Astor ballroom was the host to not only the foreign makes but a number of special exhibits of American makers, these principally being showings of the beautiful body work of some of the foremost of our body builders.

Similar to New York Salon

Though naturally on a smaller scale, the Salon here is similar in its scope to that held in New York this year. It includes several American cars as well as the foreign types. Those exhibiting are White, Simplex, Brewster, Peugeot and Lancia.

The Salon has always been regarded as a high-class body show, and the thought in exhibiting here is to get such an event started, because it is very certain that there is a place for it in Chicago.

Therefore most of the bodies on view at the Auditorium are special designs that reflect the skill of the body makers. One of the White chassis carries an especially attractive sedan upholstered in tapestry and having the new V-fronted windshield that lends an unmistakable touch of class. One of the Lancias is also a closed type of sedan design which is built with a very low roof to give a rakish appearance, this effect being accentuated by the slanting windshield.

Two of the salon exhibitors reveal their chassis. These are Simplex and Brewster.

SEVERAL SPECIAL SHOWINGS MADE

Chicago, Jan. 25—Several miniature shows are staged in quarters other than the Coliseum, Annex, Greer Building and the Armory, or the salon at the Auditorium. These exhibits range from individual motors and parts to motor cars and trucks. At the Congress is found the Dorris eight, the Ferro twelve-cylinder engine and the Champion Spark Plug Co.'s ignition specialties. Over at the La Salle Hotel the Ross eight is shown. The Ross has a seven-passenger body, Herschell-Spillman 3¼ by 5-inch, block-cast engine,

Zenith carburetor and a two-unit starting and lighting system.

At the New Southern Hotel there are being exhibited two trucks—the Indiana, made by the Harwood-Barley Mfg. Co., Marion, Ind., and the Republic, made by the Republic Motor Truck Co., Alma, Mich. The former is of the worm-drive type, and although but one model is shown there are several others in the line. The Republic features the internal drive and likewise shows but one model of several that make up the line.

Of the larger cars the usual number shown at the big show is five, although some makers are putting out more models than that. In such instances the others are exhibited in the local dealer's showrooms, where interested persons are directed by those in charge of the booths at the main show.

Besides, several dealers down the row are making special exhibits of body styles. Among these are The Bird-Sykes Co., Paige distributor, C. H. Foster, who handles the Cadillac, and Harry Newman, the Scripps-Booth distributor in Chicago.

There are numerous other special exhibits along Michigan avenue and in the vicinity of the Coliseum.

FORT WORTH DELEGATION LARGE

Chicago, Jan. 25—One of the features of the dealer's activity at the Chicago motor car show is the attendance of a party of 200 from Fort Worth and nearby sections of Texas. They came by special train Monday and their program includes a dinner Wednesday evening at the Blackstone. A special train of Overland dealers from Minnesota came from Minneapolis by way of the factory at Toledo, O.

Dealer registrations do not begin until Monday and the biggest days are generally Wednesday and Thursday. The New York and Chicago shows draw about 2,000 dealers each, but there generally are more at Chicago. Estimating upon the results of the New York show, which passed the 400,000 mark and gained 33 per cent in paid attendance, it is believed the Chicago show will set a record for national show attendance of dealers and the general public. Last year the Chicago stated attendance was in excess of 300,000.

Fifty thousand complimentary tickets were distributed among dealers and exhibitors for use Saturday night, the opening day, and aside from these 25,000 were bought at 50 cents each for distribution among prospective buyers, and this number will, it is estimated, be increased by 50 or 75 per cent.

The usual number of dealers' dinners

have been planned; this is a distinguishing characteristic of the Chicago show. One of the spectacular events, however, is missing—the Overland dinner. None was held in New York either.

FARM PRODUCTS AT SHOW

Clinton, Mich., Jan. 24—Probably one of the most unique motor shows ever held is the one which is being staged here at the Clintonian Garage. It is a combination show at which in addition to the Overland and Ford cars, there is an extensive poultry exhibition and one of all kinds of vegetables, such as potatoes, carrots, onions, turnips, pumpkin, corn, squash, etc. In another part of the building several varieties of pigeons and rabbits are shown. But the most interesting feature of the show is very likely to be found in the rear of the garage where a complete miniature farm has been put up. There is to be found a bungalow, barn, silo, windmill, barnyard containing straw stack and cows, a blacksmith's shop and pigs and chickens running about. A gravel road leads to the garage or show place and a miniature motor truck, loaded with flour is there, while at some distance a U. S. mail wagon adds still further interest to this original exhibit. The farmers and citizens from most of the surrounding territory have visited the show.

MONTREAL SHOW OPENS

Montreal, Can., Jan. 22—The third annual motor show, held under the direction of the Montreal Automobile Trade Association, was opened tonight by the lieutenant governor of the province of Quebec. If the opening night is any criterion as to attendance it is safe to say that the social recognition formerly given to the annual horse show will be transferred to the motor show. The number of cars on exhibition reaches seventy-five. Several new cars were shown for the first time, including the National, Davis, Grant, Saxon, Canadian Briscoe, Crow and Chevrolet. A feature of the show, which has given it a patriotic touch is the employment of wounded soldiers who have returned from active service as attendants and ticket takers.

FARM TRACTORS BOOM GASOLINE

Bloomington, Ill., Jan. 22—The great increase in the number of farm tractors has greatly increased the winter demand for alcohol as well as gasoline and lubricating oils in central Illinois. Farmers with tractors keep them in operation all through the year, their principal occupation during the winter months being to drive corn shredders to supply feed for stock.

Centrifugal Electric Generating Clutch Latest Power Drive

Vesta Brings Out Device Which Combines Features of Electro-Magnetic and Mechanical Types

CHICAGO, Jan. 25—Latest and one of the most important advances in power transmission for motor cars is the new Vesta, centrifugal, electric-generating clutch, which will be announced later this week by the Vesta Accumulator Co., Chicago. The idea is the combination of the electro-magnetic drag between the armature and fields of any electrical machine and the direct friction connection such as is obtained in the ordinary clutch. The Vesta clutch replaces the usual cone or disk clutch, the gearset, the flywheel, the electric generator and the starting motor. By its use the clutch pedal, emergency brake lever and gearset lever are dispensed with, all control being by buttons on the steering post and the brake pedals. The use of the Vesta system increases neither the weight or cost of the car except that of a somewhat larger battery.

Principle Not New

The Vesta system is no new thing in principle, having been brought out in crude form by its inventor, William Morrison, of the Vesta company, as long ago as 1898, and described in an engineering magazine at that time. Since that time it has been undergoing tests and refinement. The Vesta people have been testing it in a car for the past year, making one tour of 7,000 miles.

The system is composed of two parts, the armature and the field, the former constituting the flywheel of the engine and the latter mounted on the forward end of the propeller shaft. The fields are internal and rotate on bearings on the crankshaft

extension, within the armature. The armature carries an internal commutator and the fields carry the brush holders, the brushes pressing against the internal commutator.

It is in the mounting of these brushes that the real nub of the new idea is incorporated. The brushes are mounted in such a way that the centrifugal force of their rotation increases the force with which they press against the commutator, in just the same way that the balls of a fly-ball governor swing out with increased speed. When the engine is still the pressure is very light, but as the speed of the car increases the pressure of the brushes against the commutator also increases, until, at high speed, there is no slip between the armature and the field. That is, we now have a mechanical clutch, carbon

against copper. That there is little wear is attested by the fact that after a 7,000-mile tour the 2½-inch brushes decreased only 1/64-inch in length.

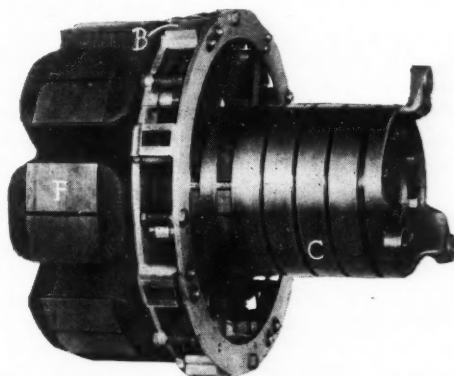
At lower speeds, and particularly in starting, the transmission of power is through the electro-magnetic drag which always is present when the armature of an electrical machine is moving with respect to its fields; that is, there is no mechanical connection between the engine and the propeller shaft until the car speed reaches a pre-determined maximum, which may be altered to suit conditions. It will be seen that the actual running of the car is independent of any current from the battery. The fields have four slip rings with which the brushes make contact for delivering current to and from the machine. The wires leading from the brushes connect to the controller and batteries.

The battery consists of four sets of 6-volts each and each has a capacity of 50-ampere hours, so that the battery for this system would correspond to a 200-ampere hour storage unit. The controller consists of a series of switches operated by push buttons through a solenoid. This throws the batteries in series, giving 24 volts for starting, but running and lighting is at 6 volts.

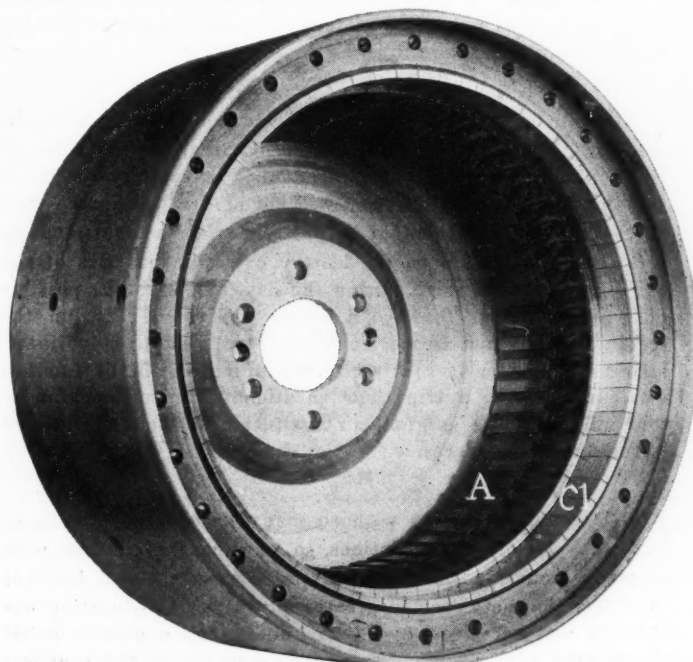
Battery Arrangement

Pressure of the starting button throws the batteries in series, causing the generating clutch to act as a 24-volt motor to start the engine. Also causing the fields to be solidly locked against rotation.

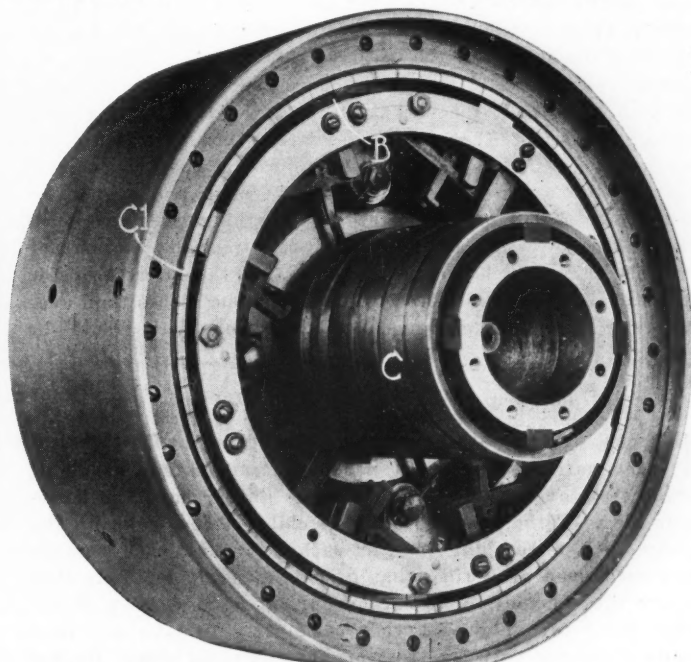
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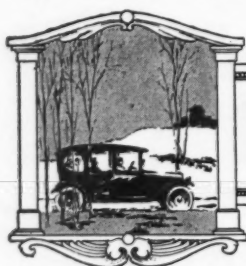
Field unit of Vesta centrifugal electric clutch. This is mounted on the end of the propeller shaft. F is one of the six field poles. B is a brush, and C is one of the collector rings



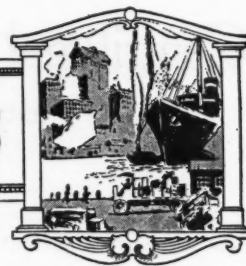
The armature of the Vesta clutch which takes the place of the fly-wheel, showing the armature windings A and the commutator C1



The complete clutch without its case, showing how the brushes B are pressed by centrifugal force against the commutator C1



EDITORIAL PERSPECTIVES



Black Cars and the Motor Show

IT is not particularly magnetic to meet a funeral party all in black. It may be suggestive of profound thoughts but not immediately attractive. Too many of the exhibits at the present Chicago show bear the funereal aspect. They are black cars, and black chassis. Not one black car but several. It is true that several exhibits as such are true to the manufacturer's specifications of color. It is also true that the rough chassis in black is finished just as well as the standard chassis that go out of the factory in tens or hundreds per day. It is true that the exhibit is as true as can be to the marketed vehicles, but does not the average visitor to the show want a little more than goes with the average car as sold? Does he not want something more in keeping with the gala event?

WALK into a large department store and see only black goods on the shelves, on the counters and in the windows. The atmosphere will be a little too sombre. So at the motor show, color is highly desirable. Color is desirable even if not exactly true to the selling code. Such color deviations do not mean straying from the course of rectitude in making sales. Having your exhibit well stocked with attractive colored cars does not mean that the salesman misrepresents. Far from it. The show is a great market of cars, and the merchandising license of mixing colors has been carried out admirably by many companies, but there are still several that could make quite radical color changes to great advantage. Cars in different colors not only adds to the general attractiveness of the exhibit but in-

creases the interest of the visitor not only in some particular car but in all of the cars, in the show in general.

NO better place than the show could be desired to try out sensible color combinations. As years ago the manufacturer relied on the show as a certain thermometer of how his car took with the public, so today this course could be followed to advantage with body color combinations. Not those outlandish color schemes that are as unsuitable on our city streets as Napoleon's coach of state; but rather color combinations that are rational, color schemes that are being used by those concerns giving color options at a slight additional cost, of perhaps \$25 to \$100.

SEVERAL prosperous, particularly prosperous, dealers in three or four of our largest cities have found it an excellent plan to repaint the standard blacks from the factory giving options of grey, maroon, cream, white and one or two other combinations, together with extra tire, slip covers, etc., at a nominal additional charge of \$100 or a little more. These varied color schemes have made many sales where the buyer turned away from the standard black. To many buyers spending \$800 or thereabouts an extra \$100 for a color to meet their own demands and to give them a car of different color from any other in their town, is not a hardship. They look upon it as a good buy. They have a distinctive car. They have accomplished exactly what they desired to do. Many dealers can imitate this painting policy to good advantage.

A Tour of America for Americans

WHY not a great national motor car tour now that our roads are being rapidly improved; now that cars are so reliable that an owner can drive them for months at a time without any special attention; now that tires are so improved over 6 years ago that the horrors of the old days have passed; now that you can travel all day in many sections of our country and come in with as clean a face at night as if you had been in your office all day; now that we have scattered throughout the country hotels as good as we can find in our first class cities; now that our roads are charted with accurate maps and road directions; now that our manufacturers of clothing have developed the science so that a trip can be made with every measure of comfort at a very low cost; and now that the interest of the great public is more directed to our own home scenes than ever before? Why not an annual national tour that would be really exemplary of motoring of today?

IT is not necessary to have the old-time grinds, with technical examinations, rigid speed schedules, cars parked at night, brake tests and technical inspections. Rather have the home-tour idea. Father, mother and the children can make up the party. Select the night stops, let each party start each morning and each noon at a time that best suits them, let them stop where they may desire to each noon, but have all stop at the same place each night. Permit each party to take any road route it desires between the morning and night stop. Do not attempt any procession idea. Let each get away from the dust idea. Each car can go at its own pace. The length of the

day's trip will depend on the party. One man can cover 200 miles between morning and night by a round-about route. Another may cover it in 90 miles. Let each wander along as best suits his fancy. Let enjoyment of our great out-of-doors be the uppermost thought of all.

PICK out historical country for the tour one year. It can be made a great education for the children, the old folks as well. Get a booklet prepared in advance of the historic points to be passed through. The cost will not be great compared with the value received. It might be possible at some night stops to arrange for a lecture on the history or scenic beauties of the territory passed through during the day. It might be possible on some occasions to have a lecture delivered right on the scene of some great former conflict. The possibilities of interesting the children in such a trip are unlimited. Many families would make such a trip their vacation. The summer family tour might become as great an institution as some educational lectures at many places.

OUR country is filled with so many beauty spots, with so many historical associations, so many majestic rivers, with so many mountain chains that it is a great national loss not to utilize the motor car to greater advantage in educating our children and ourselves, and thus building up a greater spirit of national admiration. Learn your country, is the grandest command that can be given from any government to its people. The motor car has been responsible.

Ten Cent Fare Makes Taxicab Popular in California City

Jitneys Have No Chance in Vallejo Where One May Ride for a Dime

VALLEJO, Cal., Jan. 26—Perhaps no one thing charms the visitor in Vallejo more than the careless manner in which the shop girls flag taxicabs. Vallejo is a taxi town, a 10-cent taxi town, a place where one dime will buy more motor car service than in any western city.

Nobody walks in Vallejo. Taxis in Vallejo will go anywhere on the paved or oiled streets of the city for one dime. In summer time, when the dirt streets are in good condition, the taxis will go anywhere in the city limits for two jitneys. You may hail a taxi; catch it at a stand or phone for one to be sent out to your residence or down to your hotel. The charge is all the same—10 cents.

There is no need for arguing with the driver. The rate is advertised, set and standardized. With one dime you may ride in a taxi in Vallejo with all the dignity and assurance of a foreign minister.

Sixteen Taxis \$1.60

The wife of a young naval officer recently returned from the "Islands" to Mare Island for duty, gave a party a few days ago. The young hostess decided to send taxis for all her guests. Taxis were expensive. She knew this from experiences in New York and elsewhere; but it was her first Vallejo party and she had to make good. She phoned to the taxi company and gave her orders.

The guests arrived in excellent spirits and the party was a great success. The hostess was highly complimented on her forethought.

At the end of the month the bill arrived and with misgivings the young wife opened it. She was prepared to skimp for a month in order to meet it. The taxi idea had been a social knockout.

Upon opening the bill she was almost knocked out when she read, "Service sixteen taxis, \$1.60."

The jitney does not exist in Vallejo. There is not a chance. Taxis are too popular. Vallejo's chief joy is the 10 cent taxi.

ONE KISS WORTH ONE CAR

Davenport, Ia., Jan. 22—Mrs. Bertha Spengler, a widow, resisted a replevin suit filed by Thomas Brown, a farmer, to secure possession of a motor car which she claimed he had given to her.

"What did you give him for the car?" was asked of the widow when the trial came up.

"One kiss," was her reply.

"Do you think one of your kisses is worth a motor car?" she was asked.

"I certainly do!" came an emphatic reply.

That appeared to settle the case as the

jury gave a verdict in her favor. It was brought out that Brown was perfectly satisfied with his bargain until he saw the widow riding in the car with another man. He then filed suit. The car was a Ford.

HAIL THE MOTOR CAR CHAPERONE!

Atlanta, Ga., Jan. 22—The motor car chaperone is Atlanta's latest wrinkle. He is performing the duties of regular picnic and dance chaperones except that cars are his subjects rather than pleasure-seeking couples.

A bonafide chaperone in the accepted term is supposed to be a person who can close an eye occasionally and the chaperone who is most in demand in the social world is one who can glance in the other direction at times.

But the motor car chaperone promises

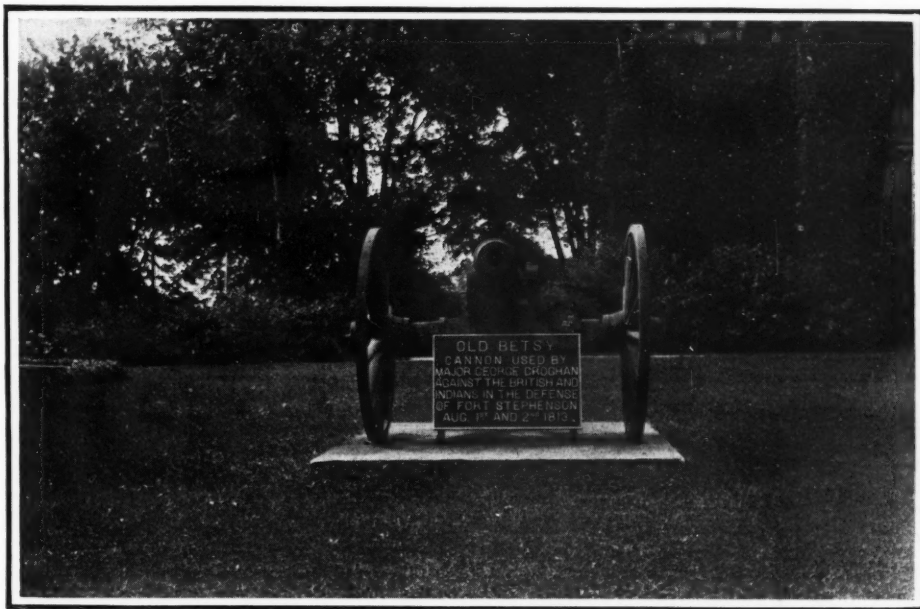
never to divert his glance from the cars in his care, nor will he allow anyone to take liberties with them. He made his debut in Atlanta recently and many cars are placed under his chaperonage.

The Flynn-Carroll Automobile Protective Association started the innovation here. It is composed of H. E. Flynn and J. E. Carroll, Jr. It aims to protect cars which are parked on the streets of Atlanta, where parking is allowed, as well as to provide service for the owners of the machines.

The company stations guards near the big office buildings and in other sections where cars are parked and the guards keep constant watch over the machines. Once a car is placed under the care of a guard no one other than the owner or his authorized representative is allowed to remove it.

See America First —

See America Now



EDITOR'S NOTE—This is the sixty-third of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling the attention of motorists to the points of interest in their own country.

NO. 63—OLD BETSY, A GUN WITH A PROUD RECORD

IN Fort Stephenson park, one of the cherished municipal possessions of Fremont, O., stands an ancient cannon whose shot turned back a superior force of British and Indians on an epochal second of August 104 years ago and won a victory that proved the turning-point in the War of 1812. "Old Betsy," as the historic gun is called, was the only piece of artillery that Colonel George Croghan, the defender of Fort Stephenson, had to repulse the attack of 700 redcoats and 2,000 of Tecumseh's Indians. It was enough. When the enemy withdrew before "Old Betsy's" awful fire, the British loss in killed and wounded was approximately 150 while of Croghan's command of 160 men, one was killed and seven wounded. At Fort Stephenson park also is the original fort and a monument in honor of Croghan, who at the age of 21 years proved a hero in the face of seemingly overwhelming odds.

Jordan Co. Organized Plans Are Completed and Two- Thirds of Stock Now Is Sold

Total Capitalization \$800,000, of
Which \$500,000 Is Preferred

CHICAGO, Jan. 25—The work of organizing the Jordan Motor Car Co. was practically completed at a meeting of the stockholders held here today. Two-thirds of the preferred stock issue of \$300,000 was subscribed and reservations made for at least one-half of the remainder by persons desiring to distribute it among their friends and business associates.

The company is based on the co-operative idea, in which E. S. Jordan, president, has associated with him on a stockholding basis practically all of the dealers who have to date arranged to handle the product; and besides several men interested in the manufacture and sale of components and accessories. To this list has been added the names of several well-known advertising and newspaper men. A portion of the unsubscribed stock is being held for prospective dealers who have expressed an interest in the new organization.

The organization prospectus calls for a total capitalization of \$800,000 including \$500,000 preferred and \$300,000 common. Of the preferred, \$200,000 is being held in the treasury. The common stock is given as a bonus with the preferred, on the basis of one-half share to every share of preferred. The preferred pays 7 per cent cumulative and is redeemable at the company's option after 2 years at 110.

Already all of the specifications of the Jordan car have been decided upon and parts for 2,000 machines contracted for with the most reliable parts makers, these including such names as Continental, Timken and Brown-Lipe.

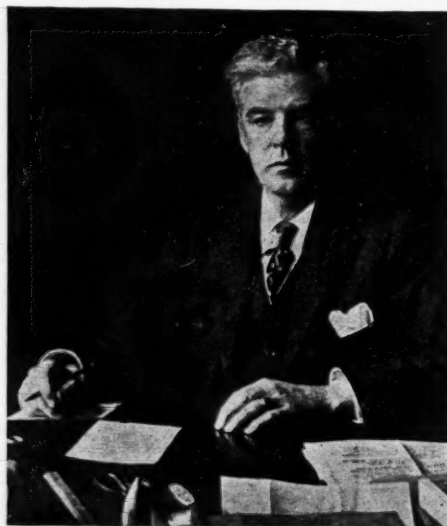
The car is a six-cylinder design, the chassis assembled from components as indicated and with particular attention devoted to body design, the lines of which incorporate the latest tendencies in custom body work.

CAN'T WASH CAR WITH GASOLINE

York, Pa., Jan. 22—The announcement by Fire Chief Harry L. Wills, that it is the intention of the state rigidly to enforce the act of 1914, providing regulations for the use, storage, sale and keeping of gasoline, naphtha and kerosene, will affect more than a score of garages and dealers in this city. The act provides that no person may wash a car or any part of a car with gasoline or naphtha. This will not bar kerosene.

One of the clauses set forth in the act is that suitable fire extinguishers must be kept on hand at all times by dealers in

oil, as well as a box of sand with a suitable scoop to scatter the sand. No smoking is allowed in any room in which volatile oils are kept or used. Fire Chief Wills stated that all the underground gasoline tanks used by York dealers for dispensing oil to motorists are safe. The tanks all have been put in place under the most careful supervision. Every tank is made of a thickness of metal that is calculated to hold with safety the amount of oil it contains.



JOHN A. HILL

The technical journal publishing field lost one of its greatest exponents in the sudden death Monday, of John A. Hill, president of The Hill Publishing Co., New York, which publishes five important technical journals, Power, American Machinist, Engineering News, The Engineering & Mining Journal and Coal Age.

Mr. Hill died as he had lived, in working harness, expiring in his motor car while on his way to his office. In the short span of 30 years he rose from a locomotive engineer on the Denver & Rio Grande to the presidency of the largest concern in the world devoted to the publication of engineering papers.

He instituted many new ideals in technical publication. He originated the policy of publishing circulation statements in each issue; he limited advertising to the field for which his medium was intended; he was the first technical publisher to issue an advertising code; he was the first technical publisher to install what is known as a service department for advertisers; in short, his business course was charted by that infallible law, "To thine own self be true, and it needs must follow as the night the day, thou can'st not then be false to any man."

New Harding Twelve Former Peerless Treasurer Heads Company to Make Twin-Six

Other Cleveland Men Interested—
Motor 2¾ by 5 Block-Cast

CLEVELAND, O., Jan. 24—The Harding twelve is Cleveland's newest car. In appearance this car is rather foreign. Instead of the straight lines of the streamline car, curves have been used, blending into each other from the radiator through the hood, cowl and body to the rear. This renders the car distinctive, but not freakish. It sets low and is furnished with crowned fenders, cowed back to the front seat and is generally graceful in contour.

The motor, manufactured by the inventors, is of the twin-six type. The cylinders, 2¾ by 5, are cast in blocks of six each and the heads are removable, thus furnishing a convenient mode for removing carbon and cleaning. The crankshaft may also be easily removed without disturbing the cylinders.

The carburetor is located on the left side and the starting and lighting units on the right, the V being left clear. The first car is a seven-passenger and it is probable that no other type of body will be built this year. Later on a roadster may be offered the public, if it is seen that there is a call for it.

F. I. Harding, formerly treasurer of the Peerless Motor Car Co., and W. C. Spaulding, formerly president of a large knitting company, are the founders of the Harding Motor Car Co., which will manufacture and market the Harding car. A number of other prominent business men of Cleveland will be interested in it. Factory space will be secured at an early date and the company will begin to build cars for the trade.

RECEIVER FOR ZEPHYR MAKER

Detroit, Mich., Jan. 24—Pending the hearing which has been set for March 17 in the Wayne county circuit court, the Security Trust Co. has been appointed receiver for the P. R. Mfg. Co., which makes the Zephyr carburetor and motor car parts. It appears that some of the stockholders desire that the company be dissolved while others are opposed to this action. According to the trustee, who will continue the business at least until the court has rendered its decision, the assets of the concern exceed its liabilities and the latter will most likely be paid in full. The capital stock of the company is \$200,000. Charles W. Proctor is president, W. Howie Muir is vice-president and Henry L. Walker is secretary-treasurer. These officers and George O. Begg and Walter Macfarlane are the incorporators of the company.

Eleven Cars Make 1916 Debut at Chicago Show

Sun, Elcar, Farmack, Gadabout and Champion New Makes in Limelight at the Coliseum

CHICAGO, Jan. 22—At each Chicago show one expects to see on view a number of cars which, on account of the lack of space, or for other reasons, did not appear at the season's opening in New York. Consequently it is not surprising to find at the Coliseum this week eleven productions which have not been unveiled to the public gaze previously. These include the Monitor, Paterson, Detroit, Glide, Dort, Halladay, Elcar, Farmack, Elgin, Gadabout and Sun. All of these have been made known to the public through descriptions in the trade papers and some of them are makes that have been on the market for a long time, such as the Monitor, Paterson, Detroit, Glide and Halladay, while the Dort is a year old, and the Elcar is the product of a concern which has been delivering motor cars for many years, though the name is new. The Farmack, Elgin and Sun are making their initial appearance at Chicago.

In addition there is one car which has come unheralded to the Chicago exhibition, this is the Champion, produced by the Champion Auto Equipment Co., Wabash, Ind. The car is of the conventional small four type in most respects, but is featured by a special tire inflating arrangement such that any two of the tires can be pumped up at the same time while the car is in motion on the road.

Though we are getting our first actual view of these cars, several of them have been described and illustrated in the December 30 issue of Motor Age, among these being the Paterson, which is unchanged from its original announcement, the Glide, the Dort, Farmack and the Sun. The latter is a production of the Sun Motor Car Co., Buffalo, N. Y. This is a new light six with the popular 3 by 5-inch cylinder dimensions. It has Remy electric equipment, a dry-plate clutch, and Hotchkiss drive. Fuel is fed by the vacuum system, and the wheelbase is 116 inches.

Elcar a Small Four

The Elcar is a conventional type of four-cylinder car with a five-passenger roadster body, selling at \$775. It is made by the Elkhart Carriage & Motor Car Co., Elkhart, Ind. It has a 3½ by 5, four-cylinder motor, in which the intake valves are in the head with the exhaust valve on the side. The gearbox is in unit with the motor and the Gemco axle is employed.

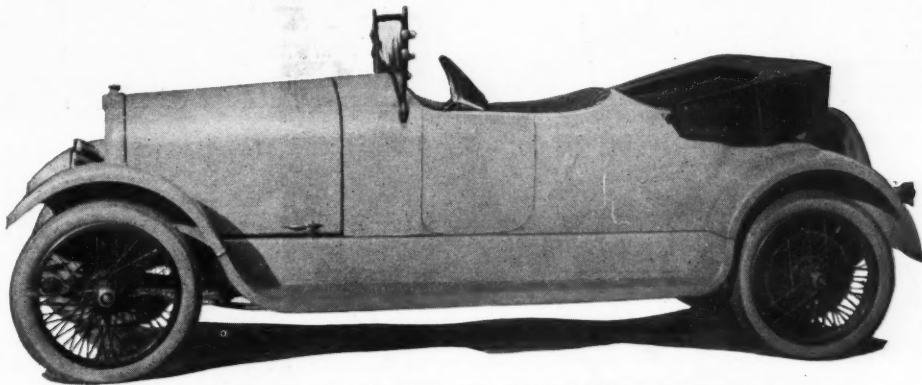
The Paterson is a six-cylinder appearing in 5 and 7-passenger bodies, selling at \$985 in five-passenger form. The parts are standard, being a Continental motor, Warner gearset, and a Weston-Mott axle. The wheelbase is 117 inches and the tires 32 by 4.

The Farmack likewise has been described

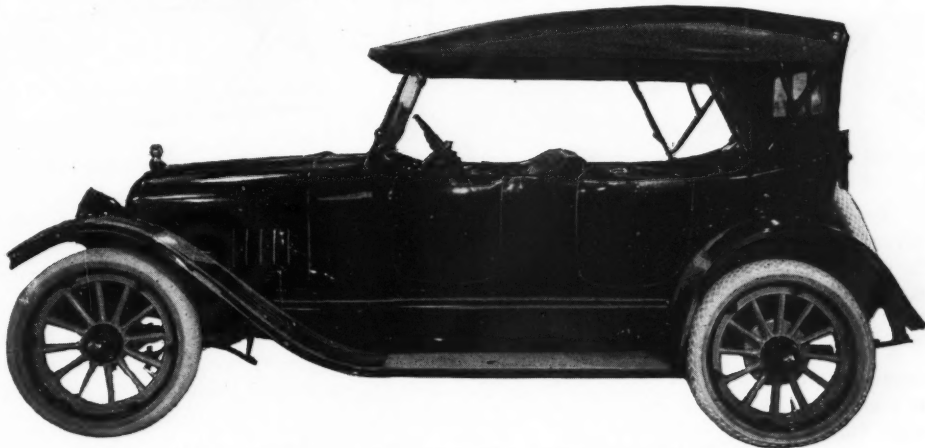
previously. This is a four, selling at \$865, in five-passenger touring or roadster form. The 3½ by 5 motor is distinctive in that it uses an overhead camshaft as well as overhead valves. The Elgin is a six at \$845 as a 5-passenger touring car or a Cloverleaf roadster. The Falls motor is

3 by 4¼ inches, block-cast. The wheelbase is 114 inches and the tires are 32 by 3¼.

The Dort is a four, using a 3¼ by 5, block motor, unit powerplant, cone clutch, cantilever rear springs. It lists at \$650 as a touring car and \$540 as a roadster.



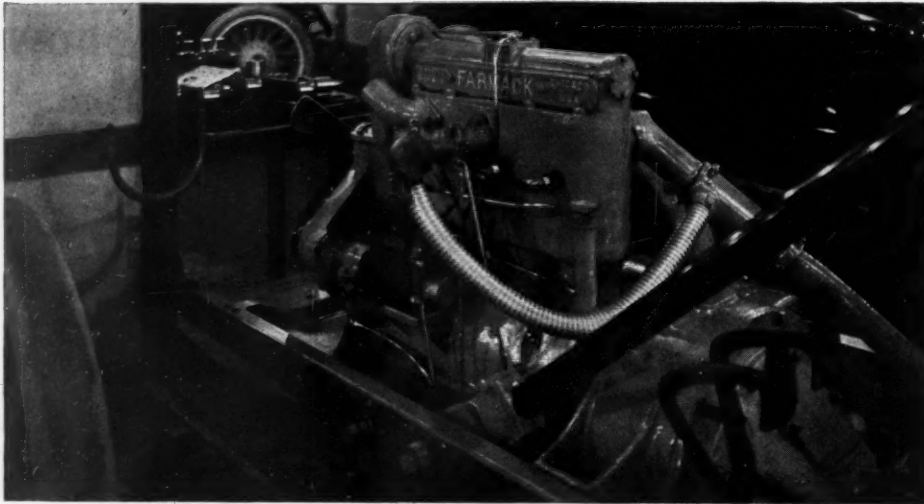
New Marmon four-passenger roadster with aluminum motor



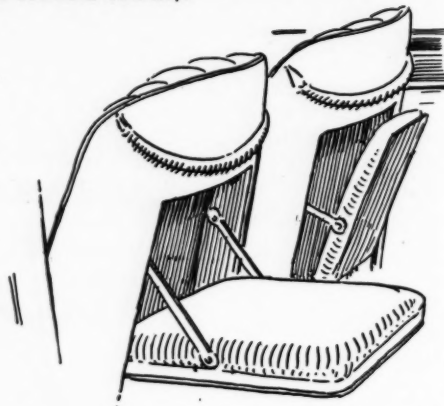
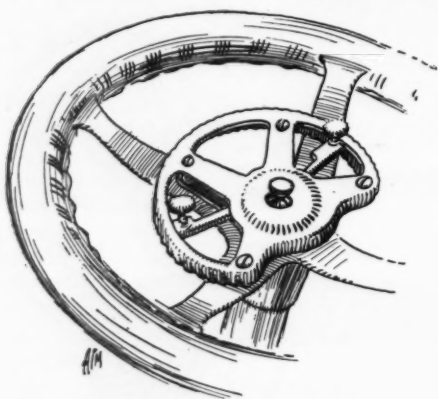
Detroit six, which makes first appearance at Chicago



Sun six, whose first showing is at Coliseum



Farmack motor with overhead camshaft



At the left is the unique spark and throttle quadrant on the Stearns-Knight. Right, the auxiliary seat arrangement on the Hudson

The Glide is a six at \$1,095 with a demountable sedan top at \$200 additional. It uses a 3 by 5, block, Rutenber motor, Westinghouse electrical equipment, and Hotchkiss drive.

A new model of the Halladay has been produced within the last few weeks. This is a six, smaller in size and lower in price than the model R which was the single model scheduled previous to the first of the year. The motor practically is the same as the 3 by 5 Rutenber employed in the larger model. However, the wheel-base is shorter, being 118 instead of 122 inches and tires are 33 by 4 instead of 34 by 4. In general design the new model is the same as the model R, employing Stewart vacuum fuel feed and a Stromberg carbureter, floating axles, pump cooling, and so on. This is made by the Barley Mfg. Co., Streator, Ill.

The Detroit Six

The Detroit has produced a new six. This is known as the 6-45 and has a six-cylinder Continental-Detroit motor of 3¼ by 4½ dimensions. It sells at \$1,098, with a very modern double-cowl touring body. A long, sloping hood, slanted windshield, hooded radiator and other features of up-to-dateness are incorporated. Some of the major specifications are: wheel-base 118 inches; tires, 33 by 4; 18-gallon gasoline tank feeding through a Stewart vacuum-gravity system; Auto-Lite two-

unit cranking and lighting system; Hotchkiss drive through semi-elliptic rear springs, underslung; floating, ball-bearing axle.

In addition to a very full list of stock equipment, special equipment is offered in tonneau windshield, Moto-Meter, and wire wheels.

There has been a slight change in the size of the Monitor six since it was announced earlier in the winter. This consists in the increase of the bore of the motor ¼-inch, so that it now is 3½ inches. The stroke remains at 5 inches. This six of the Cummins-Monitor Co., Columbus,

O., is known as the model N and sells at \$895 as a five-passenger touring. A roadster is offered on this chassis and there also is a four-cylinder model, known as the model R, which sells at \$795.

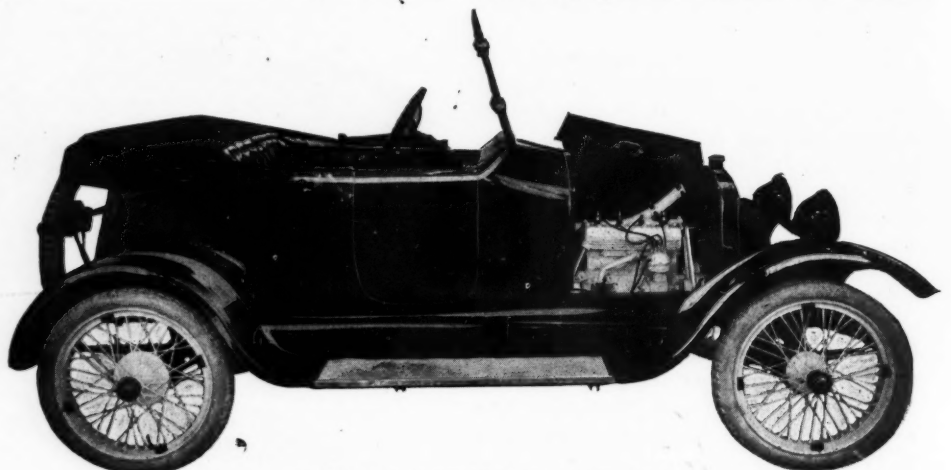
The Gadabout is one of the very smallest of the cars on exhibition, and it also is one of the lowest in price, listing at \$385 without electric lighting and cranking, or \$485 with such additional fittings as electric equipment, speedometer, clock and work light. It is made by the Gadabout Corp., Detroit, Mich.

Talking points used by the Gadabout people are the low weight, economy of first cost and operation and ease of handling, and the mechanical design is carried out on these ideas. The motor is a Sterling four, 2½ by 4, with Atwater Kent ignition. The axle is a semi-floating type with gearless differential. An open, leather-faced, cone clutch is used and the service brake is interconnected with the clutch pedal, the emergency brake being operated by a second pedal. The wheel-base is 104 inches and the tires are 28 by 3 inches. The stock body is a two-passenger, though three-passenger bodies are made to order. Wire wheels are optional.

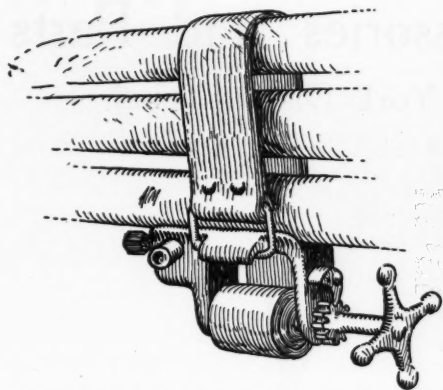
Champion Features Unusual

Offering the most unusual feature of any car at the show is the new Champion, a small four which has an arrangement designed to pump the tires while the car is under way on the road. This arrangement consists of a diaphragm type of pump, mounted on the motor and driven from the front-end timing drive. From the pump, air is carried to a distributing box on the dash, and thence to each of the four wheels. The air is led through metallic hose and the connection to the tire is through a stationary collar on each. The collar is fitted with hydraulic packing between the stationary portion and a rotating drum upon the wheel. A metal hose from the rotating drum to the tire valve completes the connection.

The distributing valve on the dash is arranged so that any one or any two tires may be inflated. It also is fitted with an automatic blow-off valve, which whistles when the pressure reaches the desired



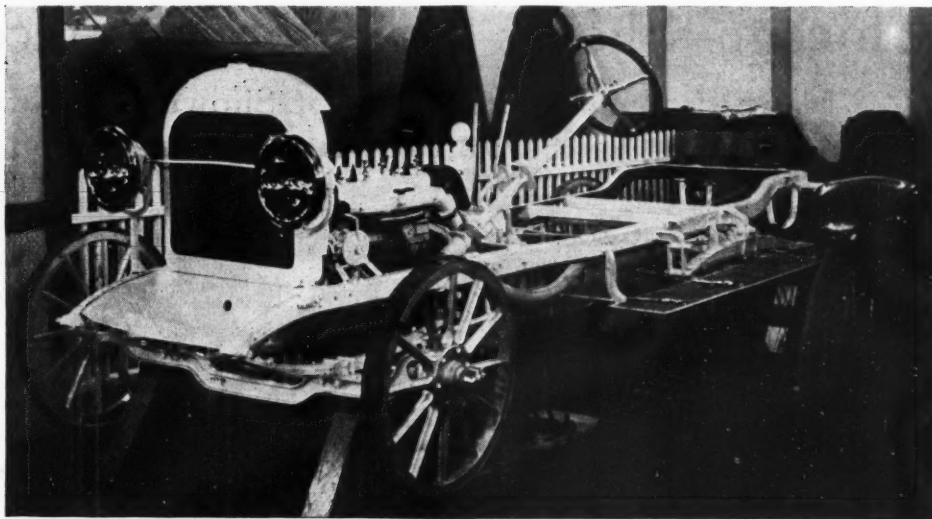
Gadabout, the smallest car at the show



Simple method of tightening top bows on the Austin to prevent rattling

amount, and also prevents any more air being forced into the tire. The pump is thrown into operation by pulling a lever on the dash.

So far as the car itself is concerned, it is a conventional small four, having a $3\frac{3}{4}$ by $4\frac{1}{4}$ block engine as a part of the unit power plant, a single plate clutch and three-speed gearset completing this unit. Carburetion is provided by a Schebler instrument and ignition by a Dixie magneto. A two-unit starting and lighting system is



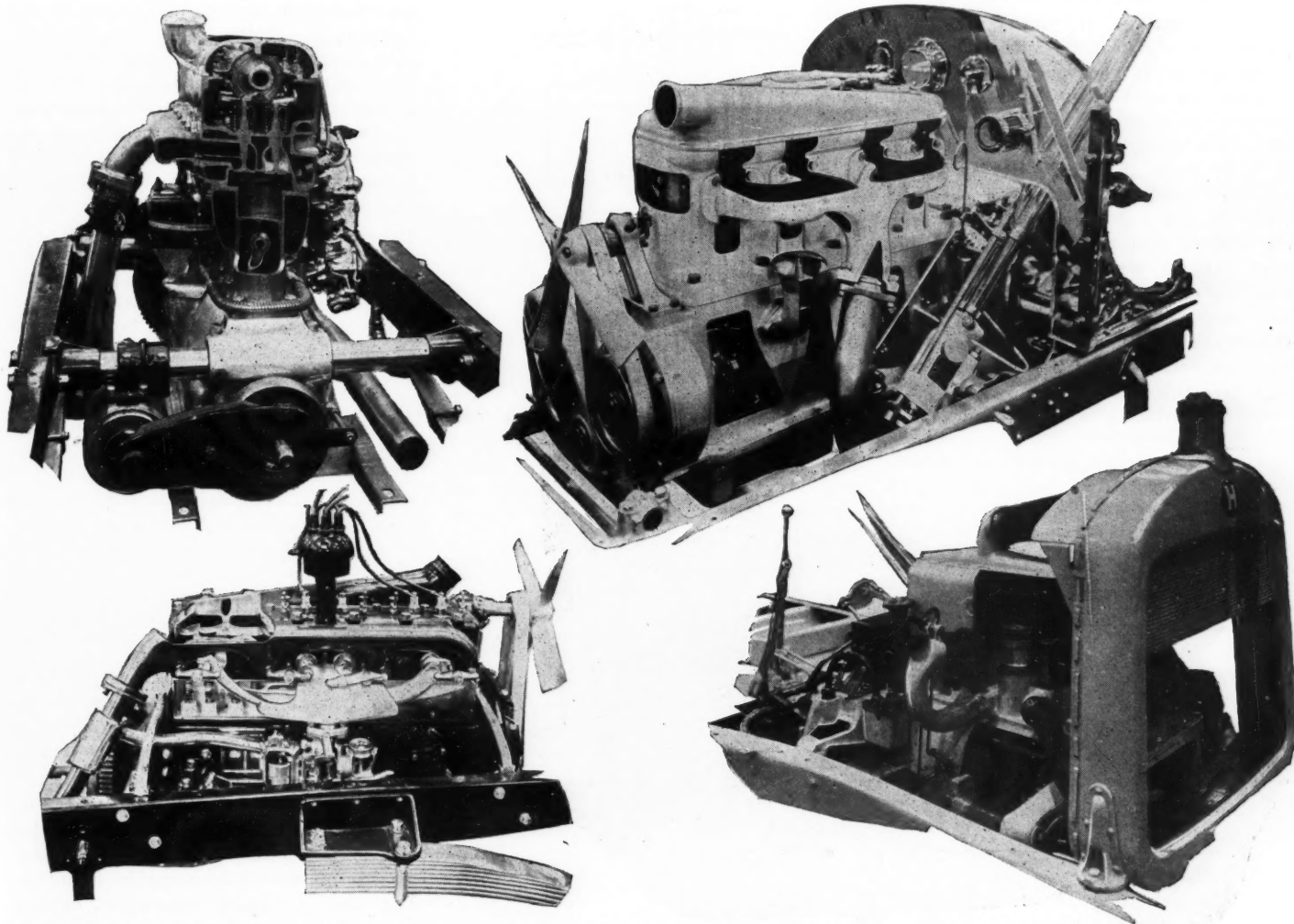
Chassis of the new Champion, with system for pumping tires while running

supplied, the drive is of the Hotchkiss type, through cantilever rear springs and a floating rear axle. The axle is a Peru make and the motor is a G. B. and S. build. Roadster and five-passenger touring are offered at \$750. Wheelbase is 110 inches, and tires are 32 by $3\frac{1}{2}$. The car is the product of the Champion Auto

Equipment Co., whose factory is at Wabash, Ind. Present plans are for the production of 5,000 cars during the coming season.

One feature of the car is the fact that the tires are manufactured by this concern. They are called Perfection tires, and use an asbestos fabric instead of cotton.

Cutaway Motors Show How Engines Operate



Upper left, type with cylinders, ports and valves exposed to show operation; right, Willys-Knight sleeve-valve operation depicted; lower left, another type with various cut-outs to show working parts; right, Hupmobile with cylinder exposed

Chicago Show's Big Crop of Accessories and Parts

Many Prominent Concerns Not Showing at New York Display Their Wares at the Western Metropolis

CHICAGO, Jan. 22—Each of the two big motor car shows invariably claims a number of accessory and parts makers that the other does not list among those present. Some of these with a more specialized distribution of their product figure that either one or the other show best meets their field, and do not go into the one which they believe does not help them materially. There are still others which are somewhat local to the show in which they exhibit, such as, for instance, a concern in Chicago that might be the western distributor for a product. Instead of the factory, which we will assume is in the east, exhibiting, this representative takes care of Chicago.

Thus when we come to the Chicago show we find that there are this year about forty names in the accessory division that were not to be found at New York, although some of the faces that were to be found on the upper floors of the Grand Central Palace in the metropolis are missing here. These range anywhere from the miscellaneous accessory exhibitor to the maker of castings, and heavy component parts, such as motors, axles and gearsets.

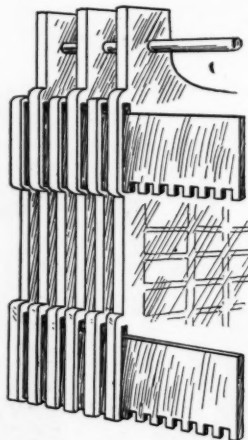
Chicago always has been recognized as a great rendezvous for dealers from all parts of the country at show time, and this may have some bearing on the fact that so many chose the windy city in preference to New York. Chicago is more centrally located and is easier to reach from all sections, and here you will find men from the far west, from the south and from the north as well as the east. Accessory makers seeking distribution points therefore are especially alert to the advantages of being housed in the show buildings here this week.

It is interesting to note some of the big Vesta patented method of holding plates apart

Two Warner Gear Co. products; at left, new two-pinion differential; at right, gearset and clutch unit



accessory names that are here for the show, and which did not appear at New York. Among them are the Remy Electric Co., the Warner Gear Co., the Continental Motor Mfg. Co., the Waukesha Motor Co., the Tuthill Spring Co., the Hess Spring & Axle Co., and many others.

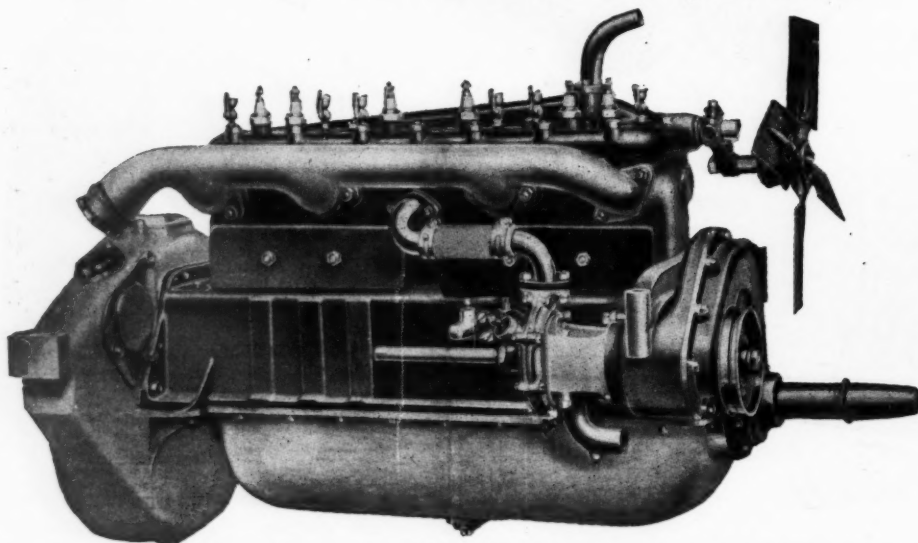


Following are presented some of the accessories which visitors at the eastern exhibition were not privileged to see on display.

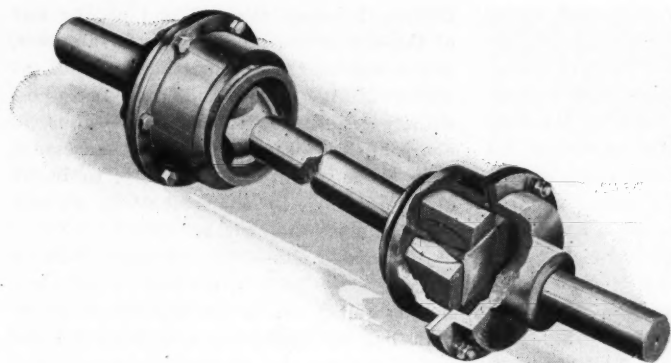
Continental Motors—Although it is not exactly a new engine, having been in production for some time, the Continental little six, known as model 7W, made by the Continental Motor Mfg. Co., Detroit, Mich., makes its premier appearance. It is a strikingly clean-cut design with dimensions of $3\frac{1}{4}$ by $4\frac{1}{2}$ inches, developing 38 brake horsepower at 2,000 r. p. m., though its size gives it a rating of 25.35 horsepower by the N. A. C. C. formula. The displacement is 223.95 cubic inches and in general the engine follows out recognized Continental six-cylinder practice with the cylinders and upper part of the crankcase in one piece and the head detachable. The valves are on the right, and of course completely housed in. On this side are also the centrifugal water pump and provision for either generator or magneto drive on the extension of the pump shaft. On the left rear side are bosses intended for the attachment of an electric starting motor to drive through gearing with the flywheel, and this unit, together with the carburetor, which bolts directly to the cylinder block, are the only accessories on the left, although the breather and oil gauge have been placed here in convenient positions.

The front of the motor is arranged to be hung from a forged cross piece at the front, and the rear supports are a part of the housing of the flywheel, the crankcase bolting to this housing direct.

Overall length of the engine is $33\frac{1}{4}$ inches from the front of the fan to the rear of the cylinder block, and from fan to rear of flywheel housing is 41 inches. The rear supporting arm width is $26\frac{1}{2}$ inch. The motor has three main crankshaft bearings, and is lubricated by a com-



Model 7W Continental little six, with bore and stroke of $3\frac{1}{4}$ by $4\frac{1}{2}$ inches, respectively



Cut-away view of the Wittemann drive, which holds shaft in four segments to fit into the bearing. These are held in a body and segments drive one way and oscillate another

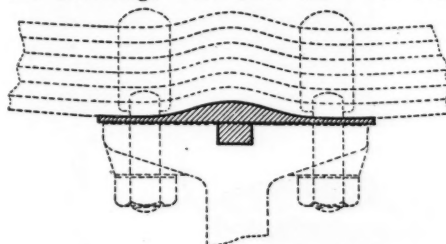
bination of force-feed and splash. The total weight, with equipment, is 480 pounds.

Waukesha Motors—Several models of truck and tractor motors are in the exhibit of the Waukesha Motor Co., Waukesha, Wis. These include a $3\frac{1}{2}$ by $5\frac{1}{4}$, four cylinder, of very compact design; a 4 by $5\frac{1}{4}$ four-cylinder type with cylinders in pairs; a $4\frac{1}{4}$ by $5\frac{1}{4}$, a $4\frac{1}{2}$ by $6\frac{1}{4}$, and a $4\frac{3}{4}$ by $6\frac{1}{4}$, these all being fours similar in design and adapted to certain truck requirements. The $3\frac{1}{2}$ by $5\frac{1}{4}$ type is a good example of modern truck design, and is especially recommended for commercial cars ranging from 1 to $\frac{1}{2}$ -tons capacity. It is a block-cast type with cylinders and upper crankcase a unit and the head detachable. Practically complete inclosure of all parts is a feature. Valves are on the right and the carbureter on the left, bolting direct to the cylinders, so that the distribution to the cylinders is through cored passages within the casting. This engine, with 202 cubic inch displacement, develops about 37 horsepower at 1,800 r. p. m. It has constant level splash lubrication in keeping with other Waukesha types, and is cooled by a pump. There are three main bearings of generous proportions. The weight is given at 525 pounds.

Vesta Batteries—The Vesta Accumulator Co., Chicago, is at the show to tell all about its new design of storage battery, which differs from the average battery in the very excellent method that has been developed of keeping the lead plates apart. This is a feature which should make for greater life to the unit. Instead of imposing the duty on the wood separators of keeping the lead positive and negative plates apart, Vesta has patented what it terms indestructible isolators which keep the plates locked apart and relieve the wood separators of any strain due to being squeezed between the heavy lead plates. These isolators consist of pieces of heavy celluloid that pass through lugs in the top and bottom of the plates on either side. In the celluloid isolators are notches that fit into the plates, thus accurately spacing the latter an equal distance apart. There is an obvious advantage to this method of positive separation at four points of the plates, for it prevents any jarring from moving the plates with

respect to one another, as would be possible were they anchored only at the top with the wood separating strips relied upon to hold the plates apart. These batteries come in all standard sizes.

Warner—One of the new component parts shown by the Warner Gear Co., Muncie, Ind., is a new two-pinion differential, designed especially for lighter types of cars. Instead of the usual four differential pinions, this gets along very nicely with two and thus simplifies the construction as well as making it lighter. It also has the advantage that since there are less



Tuthill springs, the feature of which is the absence of the center bolt

gears there is less chance for noise. In this there is another Warner gear construction. The gear teeth are short and stubby making them very strong. Other differential units in the Warner line are the spiral-bevel gear type, so popular with car manufacturers these days, and a standard straight bevel type with the usual number of differential pinions.

The Warner company also manufactures a line of steering gears designed to meet the requirements of different types and weights of cars. Model S 37 is particu-

larly adapted to many of the lighter types of cars on the market, and possesses the features of adjustability of brake, full worm wheel, quadrant above the steering wheel, and horn button in the center.

Another of the Warner products is a complete series of gearsets to meet any requirements. These are made adaptable to unit power plant constructions, cars in which the gearbox is located amidships, and types in which it is coupled up to the rear axle. A new example of the latter form is the model T 43, which is a very compact three-speed construction intended for cars from 20 to 25 N. A. C. C. horsepower. Similar to this, but designed to bolt to the motor, is the model T 46 intended for cars ranging from 20 to 30 horsepower.

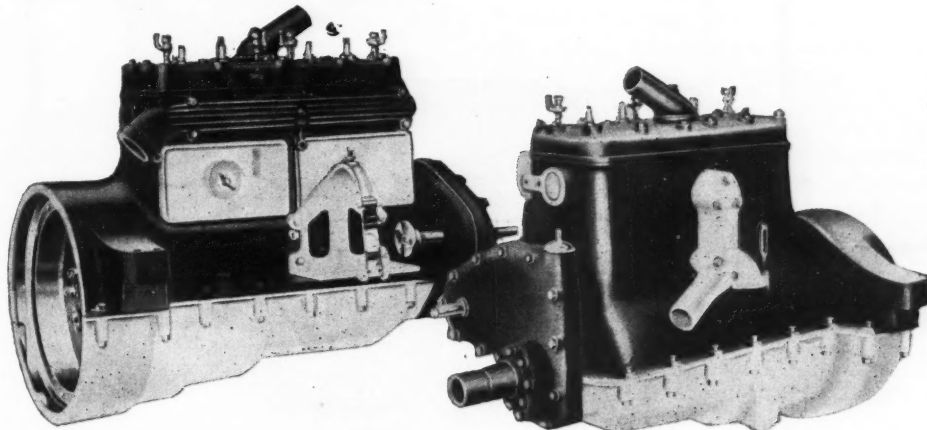
Warner also specializes in both multiple-disk and cone-clutch construction, particularly where they are intended for unit powerplant installation.

Wittemann Drive—The Wittemann drive, made by John Wittemann, Milwaukee, Wis., is a method for direct transmission of power by means of a shaft off center. This is accomplished by holding the shaft in four segments, which fit into the bearings. These are held in a body and the segments drive one way and oscillate another.

This construction forms a universal joint that has many advantages and features not contained in usual practice. The mechanical construction of the Wittemann drive causes the drive shaft to run centrally and is said to overcome wobbling. Large wearing surface and the fact that the load is uniformly divided on all parts all the time prevents wear to one side. The wear on the bearings on which the shaft runs is largely reduced, since alignment is assured.

The Wittemann drive has an end movement without resorting to a sleeve. The construction allows the shaft to move end-wise on the segments.

Lubrication is simple. Sufficient space is allowed in one of the flanges to contain the necessary lubricant, which is distributed to the wearing surfaces by means of oil grooves. There is no limit to the size of the drive it is said. It merely is a mat-



Two views of Waukesha motors designed for truck and tractor use

ter of larger parts. It also can be adapted to any drive.

Actual tests in motor cars and in machines driven direct from a motor, continually in use for more than 3 years, have demonstrated the practicability and durability of the drive, it is said.

Tuthill Springs—Well-known to the trade are the Tuthill Titanic springs, made by the Tuthill Spring Co., Chicago. In the construction of these special springs the main feature which sets them apart from the average spring construction design is the absence of a center bolt to keep the spring leaves in position. Instead a pump is given the leaves and between the bottom leaf and the spring pad of the axle a wedged shaped plate is interposed. Thus the combination with the spring bolts at either side of the pump prevent any movement of the wheels with respect to each other, and make a strong construction to relieve them from any possibility of center bolts shearing or weakening of the spring leaves due to drilling for such bolts. The Tuthill company has published a booklet listing all standard makes of cars and indicating the style and model of its springs adapted to each model of each make of car.

Hess Springs and Axles—Hess axle products are advantageously displayed at the show. These are made by the Hess Spring & Axle Co., Cincinnati, O., and include designs incorporating both the spiral-bevel gearing and straight bevels. These all have pressed steel housings, most of them ridged outwardly by webs in the top and bottom of the housing. A good example is the model 214, which is intended for the car weighing from 2,800 to 3,600 pounds. It has spiral gears and the differential is arranged for convenient adjustment to the large opening at the rear. With these axles double-internal expanding cam-brakes are used, with the brake operating rods and equalizers incorporated in the unit.

Front axles of various sizes and shapes are also manufactured as well as any design of spring. The front axles are all of the I-beam drop-forged type, while the rear designs are made either in semi-floating, three-quarter, or floating construction, and

are equipped with both ball and roller bearings.

Lincoln Battery Charger—Battery charging sets designed to be fool-proof and especially adaptable to the needs of the electric car owner, who desires to charge his machine at home, or to the requirements of the garage man who is called upon to do small battery charging work, have been brought out by the Lincoln Electric Co., Cleveland, O. These charging sets are of the motor-generator type and a special point has been made of the ease with which the apparatus can be installed by the average person. The set comes completely wired between the motor-generator and the starting switch and rheostat so that it is only necessary to anchor the motor generator to the floor, attach the switch box to the wall, and connect the two wires from the source of electric current. The charger automatically tapers off the current as the

battery becomes charged and at the end of the charge the input is only 37 amperes, depending on the size of the batteries, at which rate it is stated that there is no possibility of burning the battery. Thus, in charging an electric car, it is necessary only to do two things; namely, to insert charging plug in the receptacle on the car and close the switch.

Advance Felts—The Advance Felt & Cutting Co., Chicago, produces a complete line of felt products for the use of motor cars, besides marketing a machine for the use of dealers and jobbers which cuts felt washers to the proper size for any car. It consists essentially of a regular hand-punch press and comes complete with a full set of dies, being adaptable to cutting leather, rubber or asbestos as well.

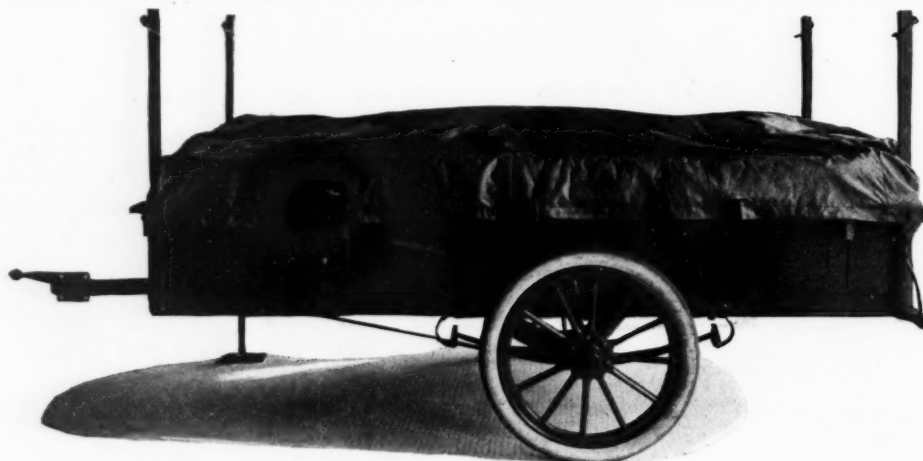
Franklin Die Castings—Die-cast parts of all descriptions, some of them being exceedingly complicated, are displayed for the edification of the show visitors by H. H. Franklin Mfg. Co., Syracuse, N. Y. This concern concludes that die castings are no longer an unknown quantity, now taking their place with stampings, screw machine parts, forgings and so forth in the construction of many well known instruments. The Franklin concern makes them of various white metal alloys which are forced into steel moulds under pressure. The work is so accurate, a finished article results which eliminates practically all machine work. One of the specialties in this line is die-cast bearings, which present an entirely finished appearance without any subsequent machining.

Cramp Castings—A large variety of motor car castings are to be found in the educational exhibit of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa. These range anywhere from bearings made either from Carson's white brass or Cramp special bearing bronze to crankcases, rear axle worm-driving gears and steering gears. A number of examples for castings requiring wiring are shown, among which might be mentioned the Torsen rear axle cross member, and a towel-sprocket wheel.

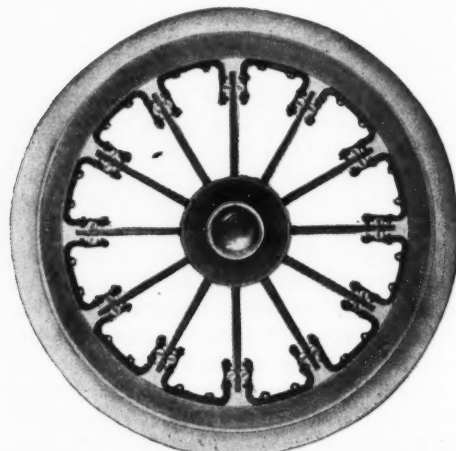
Benjamin Horn—The Benjamin Electric Mfg. Co., Chicago, is featuring among



Complete Lincoln battery charging set



Shattuck convertible outing trailer ready for the road



Chicago resilient wheel

other electric specialties, a line of horns, both of the vibrator type, and of motor-driven construction. The vibrator horns have been on the market for several seasons and the motor-driven horn is new this year. The motor operates on five to six dry cells and the principle is that of a rotating member striking the diaphragm to make an especially loud warning, adaptable particularly to touring. This horn is made for mounting either outside or under the hood, and sells for \$7.50, finished in all black enamel, and 50 cents more when it is black and nickel.

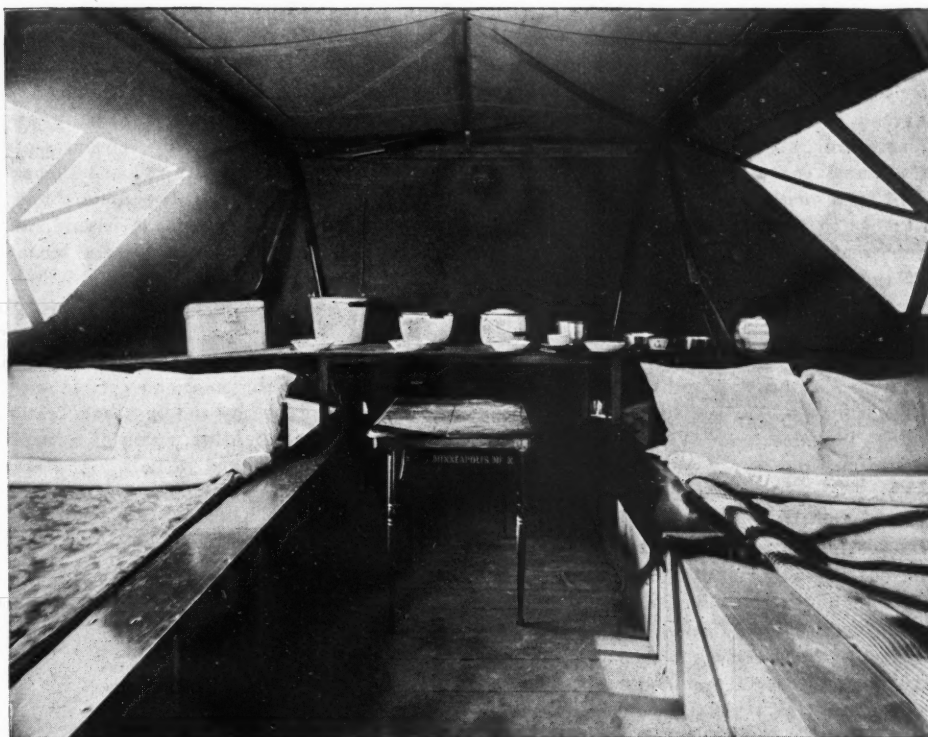
The vibrator types are in several shapes for both under hood and outside attachments and range in price from \$4 to \$6, depending on the size and finish. In their construction the vibrating electromagnets strike the diaphragm to make the signal. A magnetic horn designed for Fords is also produced, this intended for installation so that it can utilize some of the excess current furnished by the Ford magneto. It costs \$3.

Tobey Polish—The Tobey Furniture Co., Chicago, has a polish especially adapted to the motor car body and is said to be a cleaning formula containing the correct amounts and kinds of oils to preserve the life and elasticity of the body finish. It is claimed to clean the surface readily and a minimum of rubber, as removing the bluish cast often found on cars, small scratches, and rain and mud spots. In application a soft cotton cloth is used and then it is wiped thoroughly dry with another cloth. This, of course, follows the removal of any dirt by the regular washing process. Quart jugs \$1, and 4-ounce bottles, 25 cents.

Columbus Varnish—A number of motor car specialties intended to help to doll up the car are marketed by the Columbus Varnish Co., Columbus, O. These include a top dressing, cushion dressing, lamp enamel, fender japan, cylinder enamel, varnish remover, anti-rust rim paint, body polish, and a liquid wax for polishing varnished surfaces. These are sold in cans of different sizes, any of them costing 54 cents for a pint up to \$3.75 per gallon.

Non-Gran Bearing Bronze—The American Bronze Co., Berwyn, Pa., is showing various examples of its bearing materials and castings made from this type of bronze. The special feature of Non-Gran aside from the composition of the material is that it is sold in assortments of different sizes of bars to meet the requirements of the garage. Thus when a bearing must be replaced it is necessary only to turn it down on a lathe to the proper size to fit. There are 54 standard bushing sizes that can be made from the special assortment furnished. It is stated that Non-Gran differs from other bearing bronzes, not so much in the raw materials used, but in the process of alloying them into a very cohesive molecular construction, which is particularly desirable in bearings.

Imperial Oxy-Acetylene Apparatus—At



Shattuck outing trailer opened, showing comfortable interior

the show, the Imperial Brass Mfg. Co., Chicago, is featuring a special oxy-acetylene welding equipment that simplifies the process which makes it desirable for the average garage. Several forms of torches are shown, some with cutting attachments and others intended simply for welding. The outfits are portable so that tanks of acetylene and oxygen can be wheeled to the exact position required for the work. These tanks are arranged on a special hand truck with gauges and piping properly fitted. With the torches a number of dif-

ferent tips are supplied to take care of different working requirements.

Gordan Tire—Besides a line of motor car tires with a triangle-tread the Gordan Tire & Rubber Co., Canton, O., also is featuring a new cord tire made under Swineheart patents. Tubes of all sizes are offered.

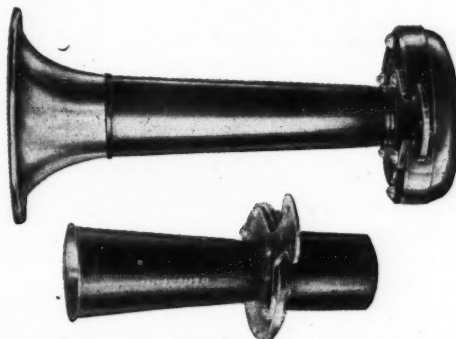
Cochran Spring Oiler—The Cochran Pipe Wrench Mfg. Co., Chicago, has a number of specialties of value to the motor car owner, one of these is the Speed-Nut wrench, which makes a quick job of gripping any size of nut within the range of the tool. It ratches on the nut, thereby permitting of quick action. Another device is the spring oiler which is in the form of a wedge driven in between any two leaves of the spring and having a ridge or oil hole cut in its side so that once in position it is easy to introduce oil between the leaves with an oil can. A dash oil gauge for Fords also is made, which is easy of installation and shows the amount of oil in the crankcase.

Ames Ford Tops—The F. A. Ames Co., Owensboro, Ky., offers a detachable top for Ford roadsters and touring cars. These are of the clutch material construction, arranged so that the doors not only hinge nicely but the attachment of the body is very rigid and there is a good fit between body and top and windshield, preventing any air or water from leaking in. The roadster type weighs about 100 pounds net and sells for \$60, while the touring car type weighs 150 pounds, and sells for \$97.50.

Yankee Pump—The Apex Electric Co., Chicago, makes the Yankee pump, a feature of which is a piston, that is said never will dry out or deteriorate from non-use.



Typical Hess spiral bevel differential unit



Two Benjamin electric horns; top, new motor-driven type; lower, vibrator form

It is a folding pump that can be carried in the tool box. It clamps to the running-board of the car, the cylinder taking a horizontal position and the handle operating as a lever. The price is \$4.50 and with a pressure gauge in the hose line, \$5.50. This same concern also has a device for Ford cars called the Fillometer, which attaches to the seat of the car, under the front seat cushion and acts as a filler cap for the fuel tank, at the same time showing the amount of gasoline in the tank. A float device operates a point on a quarter-round scale.

Dutch Brand Specialties—Van Cleef Bros., Chicago, have a line of specialties which includes enamel, paints, brazing compound, puncture cement, vulcanizing cement, soapstone, a healing compound for tubes, a tread filler and a line of chemical specialties for radiators, top dressing, rim coating and metal polish, all of these are sold under the name, Dutch Brand.

Becker Brushes—Becker Bros., Chicago, are showing brushes for starting motors lighting generators and magnetos. These are made for all types and makes of equipment coming under these heads and applied to motor cars.

Jensen Tire Pump—A tire pump is being shown by the W. H. Howell Co., Geneva, Ill., which consists of a perpendicular cylinder in which the piston is actuated by a lever, the fulcrum of which is at a V-brace carried at one side of the cylinder and the piston attached at a point between the fulcrum and the other end of the lever, which gives sufficient leverage to make operation very easy. It may be folded up and put in the tool box. Price with pressure gauge, \$6.25; without gauge, \$5.

Telometer—The telometer, made by the Zigheimer Mfg. Co., Chicago, is a device designed to test the various cylinders of an internal combustion engine to determine the height of compression pounds per square inch. It is said to determine the efficiency of the cylinders and make it possible to locate weak cylinders.

Airgo Starter for Fords—The Gray Motor Co., Detroit, Mich., offers the Airgo starter for Ford cars, which consists of an air operated rotor that attaches in the place where the crank usually is found, an air pump, a tank and a starting lever. The installation is said to be a matter of 1 hour and 40 minutes.

Chicago Spring Wheel—Gray Bros. & Co., Chicago, are showing a spring wheel in which the hub and spring spokes float in the rim, but the hub holds center, except when the wheel hits a bump in the road. The load is carried principally from the side of the car rim, however, every spring except the perpendiculars doing some of the work, each spring being at rest twice in each revolution of the wheel.

Repairing Scored Cylinders—L. Lawrence & Co., Newark, N. J., has a patented process whereby scored cylinders may be repaired without being reground. By this process it is said to be possible to fill up

deep scores with a silver composition, which is applied by electricity and smoothed down to the face of the cylinder. This composition has unusual heat-resisting qualities, and while it is hard, when applied it forces its way into the pores of the iron, amalgamating with it and becomes a part of the cylinder. It expands and contracts in the same ratio, it is said, as the cylinder, hence does not work loose. During the operation of repairing scores there is not enough heat applied to warp the walls.

Camping in a Trailer—Tourists will be interested in the Shattuck convertible outing trailer exhibited by the Shattuck Trailer Co., Minneapolis, Minn. This is a two-wheeled trailer designed to be hitched be-

hind the car on camping tours and carries a complete camping outfit. The outfit includes a large khaki-colored duck tent, two double beds, a collapsible table, an ice box and a gasoline stove.

The whole camp can be set up in seven minutes, the trailer body forming the floor and can be taken down and repacked in a similarly short time. Luggage space for a touring trunk or suitcases also is provided. The trailer will house and furnish sleeping quarters for four adults. Mosquito bar windows are supplied for light and ventilation. The outfit weighs 625 pounds and sells for \$175.

MORE TIRE PRICES INCREASED

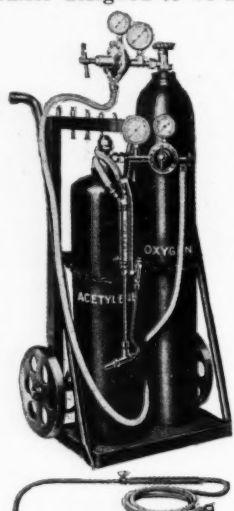
Chicago, Jan. 25—Six more tire manufacturers have followed suit in the price raise game started by the Kelly-Springfield and joined later by the U. S., Firestone, Goodrich, Goodyear, Empire, Falls, Globe, and Pennsylvania. The latest converts of the raise in tire prices are the Republic, which has advanced the price 10 per cent, the Diamond, 10 to 15 per cent, Federal, 10 to 15 per cent, and the McGraw, 10 to 15 per cent. The intention of the Hardman and Ajax companies to raise the price, as announced in last week's Motor Age, is realized this week, the former having put the price up 10 to 15 per cent, and the latter 11 per cent.

The common sizes carry the lowest increase in price, the lower percentages given above applying to the usual sizes, and the higher percentages to the occasional, or odd sizes. The Thermoid Rubber Co. expects to raise its prices 10 to 15 per cent within the next 10 days. The Qualityre company announces that it has made no change in prices and does not expect to.

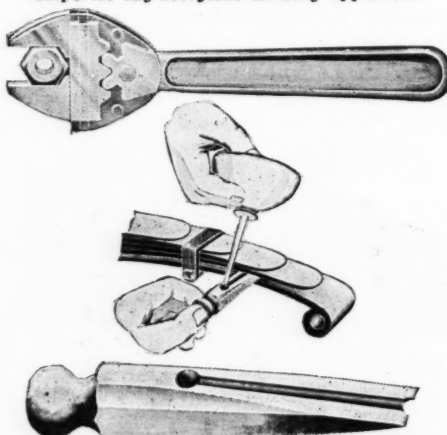
DUNLAP IS CHANDLER S. M.

Cleveland, Ohio, Jan. 24—James M. Dunlap, well known in Chicago and national advertising circles for 10 years past, will become sales manager of the Chandler Motor Car Co., this city, February 1. C. A. Emise, who has had general charge of the company's sales in the past, remains as first vice-president.

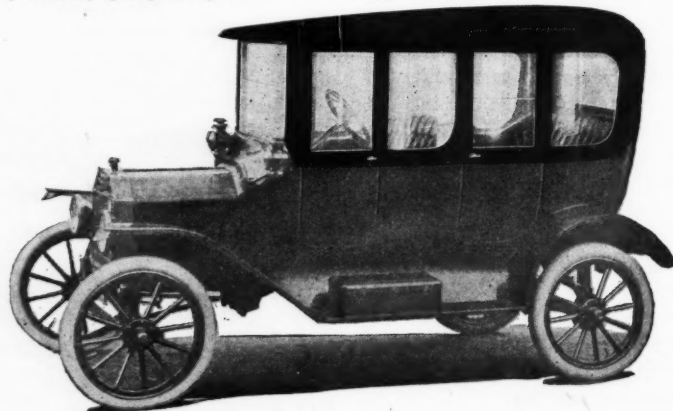
Mr. Dunlap has resigned from the management of the Dunlap-Ward Advertising Co., Chicago and Detroit.



Imperial oxy-acetylene welding apparatus



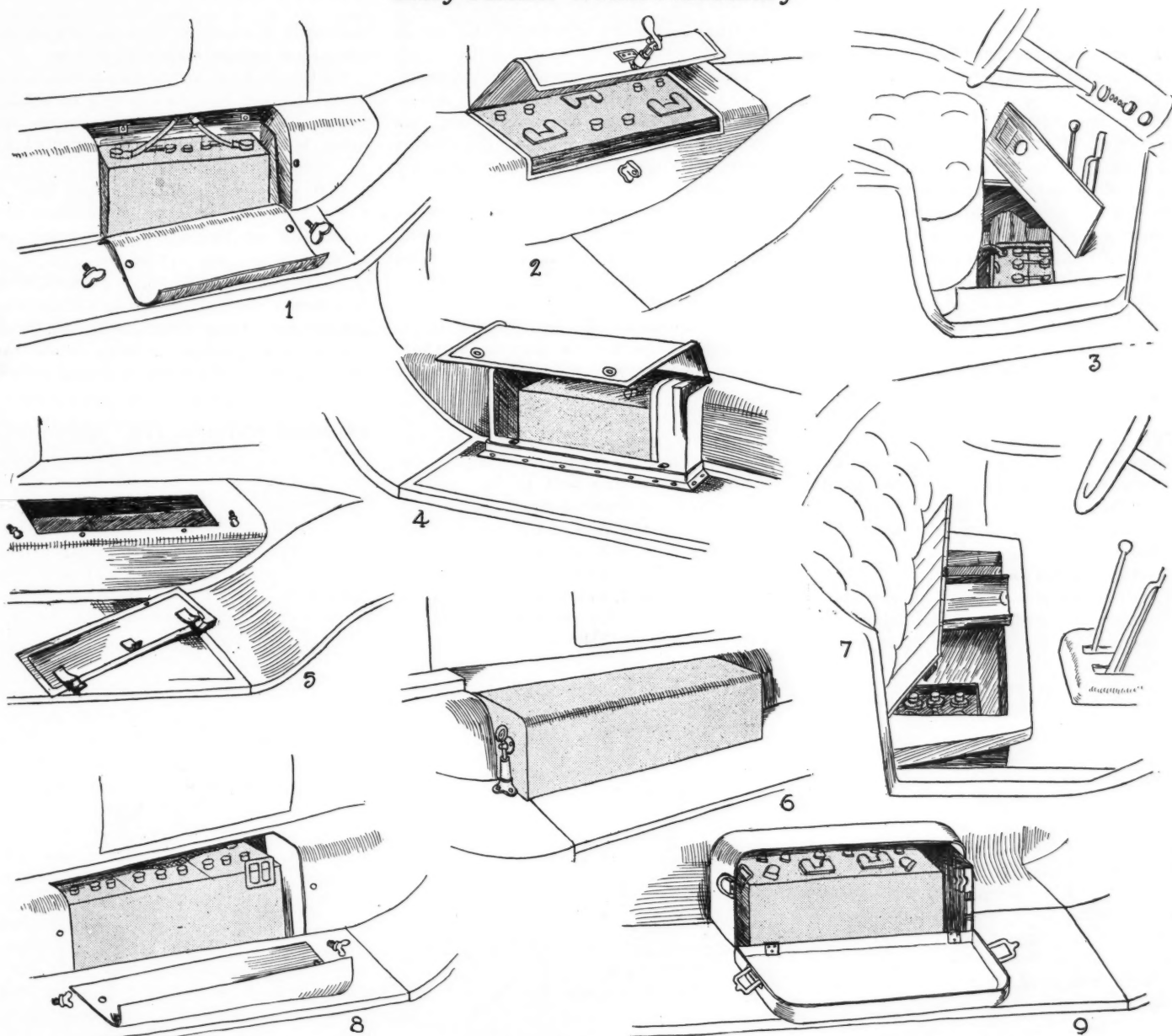
Two Cochran products; top, quick-adjusting wrench; bottom, spring oiling tools



Ames detachable top on Ford touring car

Concealing the Storage Battery Conveniently in Many Ways

How Some of the Car Makers Have Tucked It Out of Sight But Within Easy Reach When Necessary



A group of accessible concealed storage batteries. 1—Overland places the battery in the right front part of the apron and covers it with a two-sided plate; 2—How the Lozier disposes of it in the apron; 3—Buick makes it easy to reach the battery through the front floor boards; 4—In the S. G. V. the battery house protrudes slightly but unobtrusively; 5—The Grant battery compartment is very well concealed with convenience; 6—Owen lets it protrude a little, and the cover is held by spring fasteners; 7—Hupmobile has a compartment under the front seat; 8—In the Standard the battery is tucked completely back of the running-board; 9—Franklin houses it well out of sight with latches on the cover

THESE days it would almost be regarded as an unpardonable sin for a motor car designer not to conceal the storage battery somewhere about the vehicle's anatomy. But one thing must be uppermost in mind when doing this stowing. The battery must be readily accessible, and there must be provision for removing it easily should occasion demand. Several years ago there were installations that made it practically impossible to take the battery out of the car without crawling underneath, and the locations were so inaccessible that neglect was a natural result of this lack of forethought.

It may safely be said that this has entirely disappeared from present-day battery installations, and not only is accessibility paramount but methods of housing the unit are exceptionally good.

The sketches herewith will show how a number of different designers have gone about it. The running board apron seems to be a favorite place, and quite a number have chosen it. When the cover is in place, the apron has as smooth a line as any other, and yet with the very easy removal of the cover, the battery is at once conveniently exposed. It is almost as handy as if it were on the running board

itself. Above are illustrated the varying ways that such makers as Overland, Franklin, Owen, Lozier, S. G. V., and Standard have done it.

Grant has quite a convenient installation. This is also in the apron, but it is forward just at the point where the front fender joins the running board. Several makers utilize space under the front seat for this purpose, one of the good examples being the Hupmobile. It is only necessary to raise the seat cover, when the battery is very easy to reach. Others place the battery immediately below the floor boards either in front or back, as in the Buick.

Many Novelties in Spare Tire Mountings on the New Cars

Aim Has Been to Make Them Thief Proof as Well as Substantial—
Ingenuity Displayed in Locking Devices

TYPICAL of the thoughtfulness of the car manufacturer in details of design are the numerous ingenious contrivances to be seen at the Chicago show which are intended to insure the rigid mounting of spare tires and to prevent thieves from detaching them. These devices carry many advantages to the motorist, among them being confidence in the safety of his spares when he is obliged to leave the car standing in the street for a considerable time, and the assurance that no objectionable squeaks or rattles will develop in the tire carrier.

A number of the most interesting arrangements on view at the show are illustrated in the accompanying sketches.

The Winton construction, depicted in Fig. 1, employs a toothed nut G which prevents the locking bolt from being withdrawn when the padlock hasp, passing through a plate and between two of the teeth on the nut, keeps the latter from being turned.

Several Tension Devices

On the Empire, Fig. 2, a shoulder F prevents the padlock from being withdrawn, while the hasp of the lock bears against the nut E on the end of the locking bolt of the carrier so that it is im-

possible to remove it without the use of the key.

Locomobile uses a tension arrangement, Fig. 3, a shoulder L preventing the loosening of the locking mechanism until the padlock is removed, releasing the tension lever, after which the tires may be easily dismantled.

On the Stearns-Knight eight another tension device is a feature, there being two tension levers in this construction, as illustrated at Fig. 4, while the padlock serves to maintain the pressure.

The Stearns-Knight four uses a chain, inclosed in leather to prevent rattling, the padlock securing the ends of the chain together.

A very simple device is found on the Studebaker, as depicted in Fig. 6, the rectangular plate K forming the nut on the end of the locking bolt of the carrier. This cannot be removed when the padlock is in place as the hasp of the latter passes through a hole in K and also through the carrier plate, locking them firmly together.

Cadillac, Fig. 7, has two little cranks H which are prevented from turning to release the locking bolts of the carrier by the padlock hasp, which incloses both crank handles, a shoulder on the handles

rendering it secure. Rubber jackets around the crank handles prevent rattling.

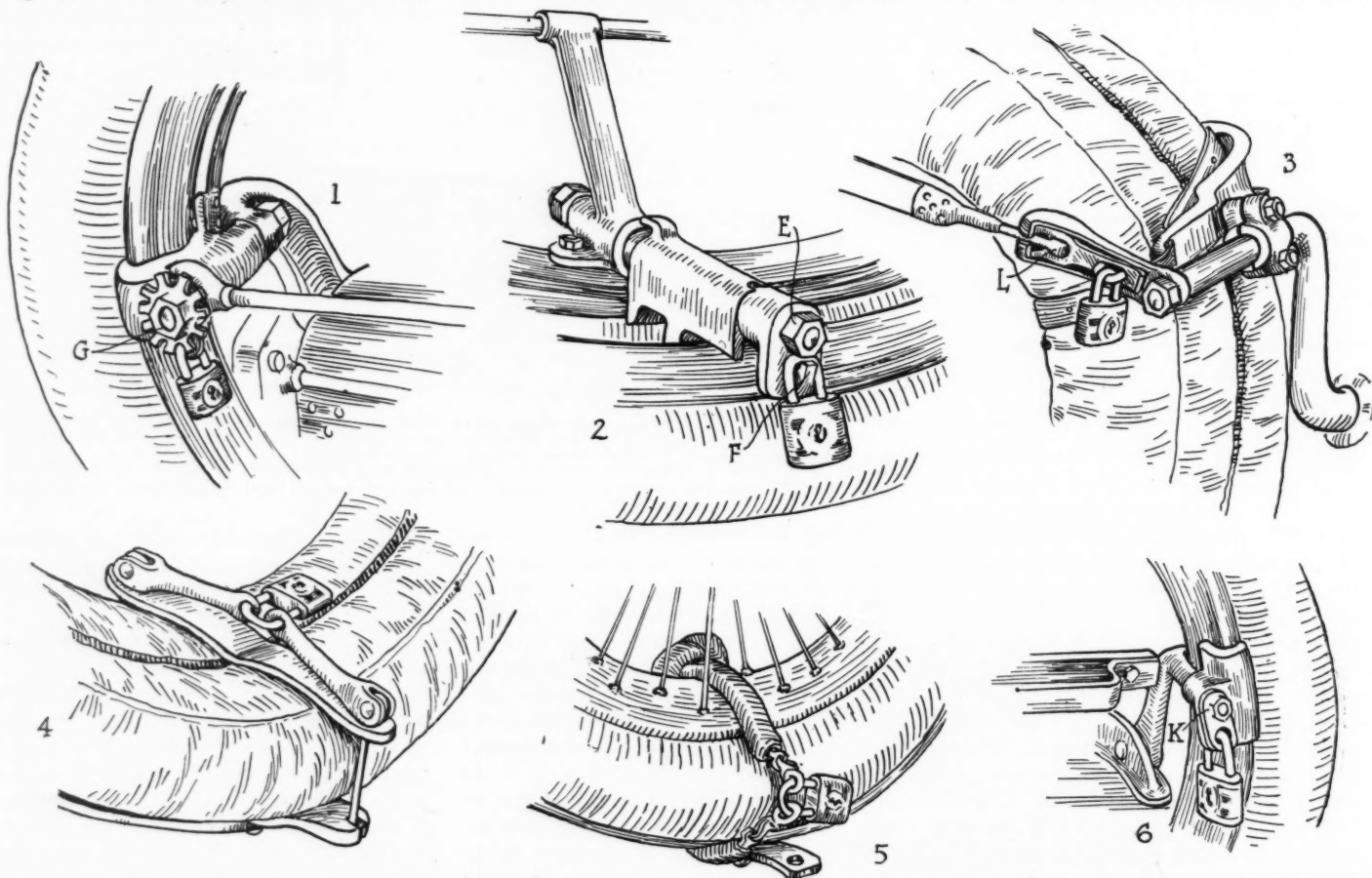
On the Packard arrangement, Fig. 8, one of the locking bolt nuts J may be readily removed, but this is useless unless the other is released, which is prevented by the hasp of the padlock.

Pierce-Arrow, Fig. 9, the hinged band A has a Yale lock at B, which prevents any possibility of the spare tires being removed without the use of the key.

On the Moon, Fig. 10, a pivoted lever D releases the locking cam, the locking arrangement being shown, with the lever locked in a vertical position, while the dotted lines illustrate the releasing action.

FARMERS ENTHUSIASTIC MOTORISTS

York, Pa., Jan. 22—The growing popularity of the motor cars on the farm is demonstrated by the fact that Pennsylvania farmers own more than 14 per cent of the cars registered in the state during the last year. On the first of the year there were 22,608 cars in the hands of the farmers of the state, according to the estimates of the bureau of statistics of the department of agriculture. The reports show that 9.5 per cent of the farmers are



Half a dozen spare tire mountings and locking devices: 1—Winton; 2—Empire; 3—Locomobile; 4—Stearns eight; 5—Stearns four; 6—Studebaker.

car owners and this means that there is a car on one out of every ten farms. A year ago it was estimated that there were 15,000 cars in the hands of farmers of the state, but the popularity of the motor car, both for business and pleasure, has been so marked among the tillers of the soil that the remarkable increase of 50 per cent has been made in 1 year's time.

In 1915 there were 159,984 cars registered in Pennsylvania and the farmers are shown to own 14.1 per cent of that total. Many of the registrations granted by the state were for cars owned by non-residents and the percentage of farmers owning cars is likely to be much higher if the total

number of state owners could be ascertained. The rural residents undoubtedly led by a fair margin all other classes as purchasers of cars during the year.

In ten out of 67 counties the reports show that from 15 to 18 per cent of the farmers own cars and in 31 counties 10 per cent more of the farmers are shown as car owners. Lancaster county leads with more than 18 per cent of the farmers owning an estimated total of 1,842 cars. Chester county farmers own 1,019 cars and Bucks county farmers, 963 cars. In many counties during the year, gains of 100 per cent in the number of farmers owning cars were common.

Race Gossip Heard at Chicago Show

Indianapolis Plans to Build Two Cars—Entry Blanks Out for Windy City Events

CHICAGO, Jan. 26—The sixteenth annual motor show, being held this week in the Coliseum and allied buildings, has attracted several of the racing officials and promoters of the country and resulted in the preparation of much fodder for the digestion of the hungry speed fan. Among the notables in the realm of speed who now are in this city are: Richard Kennerdall, chairman of the contest board of the American Automobile Association; Clifford Ireland, western representative of the national racing tribunal; Johnny Aitken, of Indianapolis and Barney Oldfield, of Los Angeles, race drivers extraordinary; George R. Bentel, manager of the Los Angeles speedway; and E. R. Schultz, manager of the Sioux City course.

New Cars Under Construction

The most sensational announcement of the week is that the Indianapolis motor speedway is about to start the construction of two racing cars that will be campaigned under the colors of the Hoosier promoters during 1916. Patterns already have been made for the cars and a deal now is pending with a leading maker for their construction. The Indianapolis speedway already owns two Peugots, bought last fall and driven at New York by Howdy Wilcox and Johnny Aitken, and in addition, Carl Fisher and James Allison, two of the four owners of the brick oval, are the backers of the Maxwells, raced under the name of the Prest-O-Lite team and under the management of Eddie Rickenbacher.

The object of the Indianapolis promoters is said to be twofold. First, they believe that the day has come when the public wants races between teams from the various cities in which speedways are located, similar to the baseball pennant fights in the National and American leagues, and second, they are anxious to develop American cars to dispute the challenge of the foreign mounts.

Entry blanks for the first two contests

to be run on the Chicago speedway this year—the amateur driver's event, scheduled for May 20, and the 300-mile motor derby, which will be held June 10—were issued this week. The amateur race will be known as the Western Interclub and cars and drivers entered are to represent the various motoring and athletic organizations in this section of the country. The owner must be the driver of the car and in addition to being an amateur, must be affiliated with some incorporated club, such as the Chicago Automobile Club or the Chicago Athletic Association.

The amateur race will be run in three preliminary heats of 20 miles each and a

30-mile final for which the cars finishing first, second and third in the preliminaries will be eligible. In order to qualify for the contest, drivers must make three laps of the 2-mile oval at a minimum speed of 55 miles per hour.

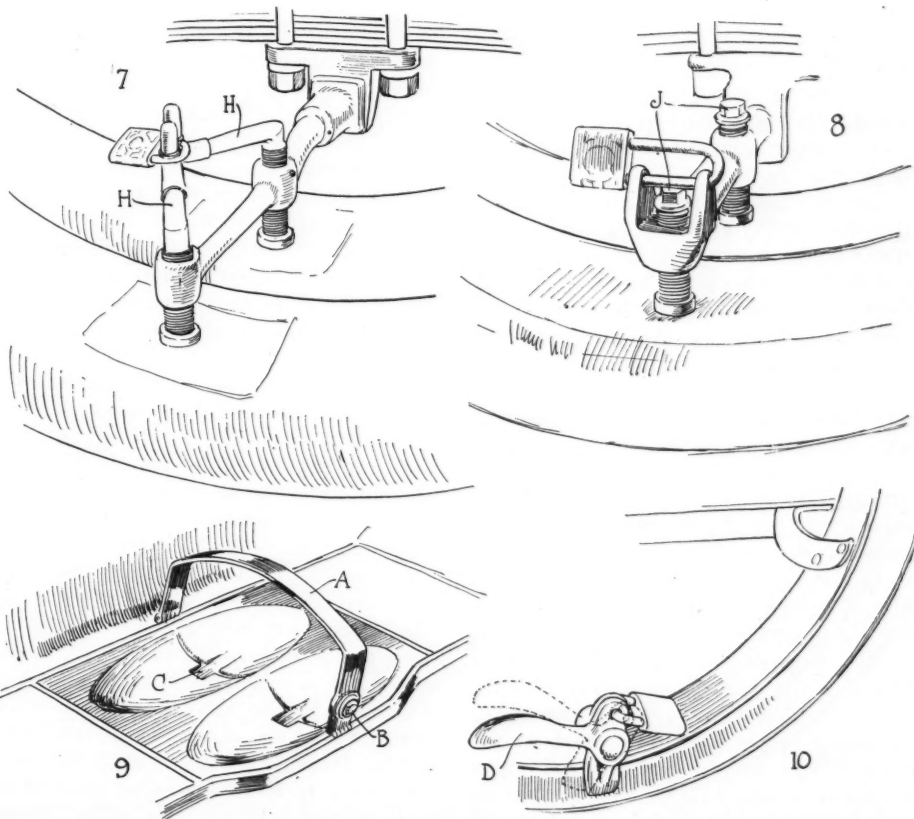
The winner of the final heat will be given a silver cup, which will become the permanent property of the driver who captures it three times in succession. Gold brassards will be awarded the heat winners. The entry fee is \$10.

In addition to the 300-mile race, already sanctioned for July 4, the management of the Twin City Speedway is planning a meet for Memorial Day when a series of short-distance events will be run. At the annual meeting of the association, February 1, a manager will be appointed and plans for the season definitely outlined.

The financial difficulties in which the Twin City speedway was entangled have been settled. The total indebtedness of the association is placed at \$515,000, but the creditors have agreed to receive \$350,000 in bonds and the remainder in cash. Deeds have been filed for the property, the necessary bond issue floated, and all the mechanics' liens satisfied.

Improving Los Angeles Track

According to George R. Bentel, southern California agent for the Mercer and manager of the Ascot Park speedway, \$16,000 has been raised to defray the cost of resurfacing the Los Angeles speedway and when the work is completed, the course promises to be the fastest 1-mile track in the country. The next race will be held there on Washington's birthday for a \$5,000 purse.



Odd and efficient tire locks and holders: 7—Cadillac; 8—Packard; 9—Pierce-Arrow; 10—Moon

Woods Motor Vehicle Co. Will Build Gas-Electric Car

Gasoline Engine Drives Generator, Recharging Batteries and Operating Motor—National Acme Capital Increase

CHICAGO, Jan. 23—The Woods Motor Vehicle Co., Chicago, expects to announce, next week, a car of distinctly new type, which combines all the ease of manipulation that has characterized the electrics it has been building for 17 years with the speed and touring radius possibilities of the gasoline car. The combination also permits the dual powerplant so that should either system get out of order the car may proceed on the other independently. The combination also is designed to give a flexibility to the car that can be had neither in a purely gasoline or a purely electric car.

The design is based upon the provision of a gasoline engine and electric generator to provide current for the electric motor, either direct or through the intermediary of a storage battery. It includes a four-cylinder gasoline engine of the Woods own manufacture, an electric motor-generator direct-connected to the engine and a twenty-cell storage battery of electric vehicle type.

Engine Idles Below 10 15 m. p. h.

At speeds below 10 to 15 miles an hour, the gasoline engine idles, being driven by the electric motor which drives the car and which receives its current from the storage battery. When it is desired to travel at higher speeds, the gasoline engine is brought into play and can be used either in conjunction with the storage battery or to supply current direct to the electric motor from the generator. The connections are such that when the engine is generating more than sufficient for running the car it automatically keeps the storage battery charged.

The automatic cut-outs are arranged so that the battery charge is kept within the limits between dangerous undercharge, and sufficiently high charge to cause gassing. Control of the whole car is by means of two small levers on the steering wheel which give all the forward and reverse speeds, the forward speeds being practically infinite in number. These controls also throw the gasoline engine into and out of play and also operate the electric brake. The 20-cell battery has sufficient capacity to run the car without the assistance of the gasoline motor for 35 miles, so that it is independent to a certain extent of the gasoline power unit. The battery is approximately one-half the size of the average electric vehicle battery which usually has approximately 40 cells.

The addition of the gasoline engine and its accessories is more than offset by the reduced size of the battery and other weight economies and the new car weighs considerably less than the present purely

electric Woods car of the same model.

At the present moment it is expected to produce only the coupe as the first model. This will sell at something under \$2,700, and deliveries are expected on this by April. That the Woods company expect to produce a quantity of the new cars may be taken from the fact that they are coming through the factory in lots of 250 as compared with the lots of fifty in which the present electrics have been produced. The car has been undergoing road tests for two years. The wheelbase is 105 inches, which is 5 inches greater than that of the present electric model.

INCREASE CAPITAL \$6,500,000

Cleveland, O., Jan. 22—At the annual meeting of the National Acme Mfg. Co., the stockholders authorized an increase of capital stock from \$2,500,000 to \$9,000,000. Of the new stock \$1,500,000 is 6 per cent preferred, while the remainder is common. The Cleveland Trust Co. purchased the entire block of preferred stock and disposed of it in a very short time at 102 to local investors. This stock is to be retired in ten equal installments of \$150,-

000 each beginning January 1, 1917. A sinking fund will be established and the redemption price has been fixed at 103, or the entire issue may be called in at any time on proper notice at 105.

President Alexander said that a substantial stock dividend will be announced later. It is not known as yet what this will be, but various guesses have been made well up in the scale.

PLOW COMPANY CONTROLS HEIDER

Rock Island, Ill., Jan. 24—The Rock Island Plow Co. closed a deal last week by which it secures control of the Heider Mfg. Co., Carroll, Ia., including the Heider tractor and all rights connected with the patent and manufacture. The special machinery, patterns, templets, and all raw material owned by the Heider company, now is being shipped to Rock Island. H. J. Heider, the designer and inventor, will be retained by the Rock Island company and he and a number of his employees will remove to Rock Island and be placed in charge of the construction of this machine at the Rock Island plant. The Heider tractor was developed 7 years ago.

Vesta Electric Clutch Latest Power Drive

(Concluded from page 17)

This is very important as it prevents any possibility of the car moving backward when starting and does away with the necessity of having to apply brakes while starting the engine.

The clutch is so constructed in regards to its electric generating force that the engine cannot be stalled.

To start the car, all that is necessary is to give it fuel by either applying the throttle lever or the accelerator, since the running side of the controller is connected with the gas feed.

Assuming that the car is running on a level and unobstructed roadway and that no current is flowing in the circuit, and that the centrifugal clutch is producing all the clutching effect and we come to an obstructed roadway, such as through sand or up grade, and we require greater clutching effort. This obstructed roadway will cause a greater load against the movement of the car, consequently causing the fields to run slower than that of the armature which is connected to the engine, this difference of slip causing current to be generated. This current will commence flowing through the fields until the field coils have received somewhat more than their normal amount, this small excess

amount being due to the fact that the cutout is made to cut in when the voltage is higher than 8 volts.

When a still greater clutching effort is required above that which is produced by the current flowing in the fields the current will flow over the batteries, making up for the difference required in the clutching effort, since this greater amount of clutching effort has caused the cutout to cut the batteries into circuit. When the obstructed roadway is overcome the centrifugal clutch will cause the current to cease flowing as before, and the centrifugal clutch will commence doing the work as before when the unobstructed roadway is again reached.

It will be seen that the centrifugal clutch can be put in to do all the work even on the most obstructed roadway without the aid of any electric current, after it has once cut in, but in this case we would not have any current generated for starting our engine and for furnishing lights on the car. The centrifugal action is so arranged relative to the electric generating effect as to furnish the current for starting and lighting with as little waste as possible. Deliveries on these clutches will begin in the summer.

Wisconsin's Unique Upholstery Law Becomes Effective

Measure Is Aimed to Promote Sanitation—All Covering and Filling Must Be Labeled to Show Material

MILWAUKEE, Wis., Jan. 22—A new law passed by the Wisconsin legislature in 1915, and effective January 1, 1916, which has generally escaped notice, but is of wide importance, relates to upholstering or repairing the upholstering of motor cars. The law now in effect requires the branding or labeling of the upholstery to show the kind of materials used. It is regarded as a measure to promote sanitation. The statute reads in part as follows:

"Any person upholstering or re-upholstering any furniture or motor car box-spring or any other article or thing whatsoever, or who manufactures for sale, offers for sale, sells or delivers, or who has in his possession with intent to sell or deliver any goods or article of any kind containing upholstering, without a brand or label as provided in subsection 3N of this section, or who removes, conceals or defaces the brand or label thereon, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than \$25 nor more than \$500, or by imprisonment in the county jail not to exceed 6 months, or by both such fine and imprisonment.

Must Be Plainly Marked

"The brand or label provided in subsection 3N of this section shall contain, in plain print in the English language, a statement of the kind of materials used in the filling and in the covering of such upholstery or re-upholstery, to be specified in true terms according to the grades of filling and covering used by upholsterers or re-upholsterers, whether such materials are, in whole or in part, new or second-hand, the qualities of the materials used, and whether the materials used, if second-hand, have been thoroughly cleaned and disinfected. Such brand or label shall be in the shape of a paper or cloth tag to be securely fastened to each article upholstered or re-upholstered."

The far-reaching effect of the statute on manufacturers of motor and other vehicles can readily be discerned. Up to this time there has been no report of violations or arrests.

SAGINAW EIGHT TO SELL AT \$1,050

Saginaw, Mich., Jan. 22—The Saginaw eight to sell at \$1,050, is to be made here by the Lehr Motor Co., capitalized at \$500,000 under the laws of Maine. The Michigan Securities Commission has granted permission to the new concern to sell stock in the state.

A plant will be erected near the Pere Marquette road and with the exception of such standard parts as motors, axles, frames, carbureters, etc., it is the inten-

tion to make many of the minor parts in Saginaw.

The officers of the new company are William M. Guider, president; Alfred F. Myer, vice-president; Curt M. Schwahn, secretary-treasurer; Harry D. Mackey, of Cleveland, O., general manager and designer. These officers and Harry E. Oppenheimer, chairman of the Saginaw Chamber of Commerce, and Attorney Emmett L. Beach, form the board of directors.

McCULLA RETURNS TO PACKARD

Detroit, Mich., Jan. 22—W. R. McCulla will return to the Packard Motor Car Co. February 1. About a year ago he left Packard to take the position of assistant chief engineer of the Knox Motors Co., Springfield, Mass., and has been in Europe considerable of the time studying war truck conditions for his company. Prior to that he was associated with Packard in the research engineering department, coming to this company from the Hudson Motor Car Co., where he had been in the experimental end of the business.

McCulla will resume research engineering work at the Packard factory, specializing on aviation.

STUTZ FACTORY TO BE DOUBLED

Indianapolis, Ind., Jan. 24—Work has begun on a new four-story building, 80 by 208, of the Stutz Motor Car Co., which will give it double its present manufacturing capacity. The new building is being erected immediately north of the present plant and the contracts call for completion of the building June 15. President Harry Stutz says that this new building will make it possible for the company to manufacture more of the parts entering into the car which at present are purchased outside.

FIAT ALLEGES INFRINGEMENT

Poughkeepsie, N. Y., Jan. 22—The Fiat company has brought suit in the United States district court of New York against the Olds Motor Works; Chas. H. Larson, doing business as the Oldsmobile Co., of N. Y.; and the Cutting, Larson Co., claiming infringement of design patent No. 48,219, issued November 30 to Carlo Cavalli, of Turin, Italy, who in turn assigned to Fiat. The Fiat company claims infringement on the design of its present radiator and hood, and asks for an injunction pending the suit restraining the defendants from infringing the said patent and also asks for costs and an accounting of damages.

Edwards, Sager & Wooster are the lawyers for the plaintiffs. The Olds company has not as yet answered the suit, which

was brought yesterday. C. V. Edwards, representing the Fiat company, states that the company wants the design of the radiator changed and that that is the main point in the suit.

BRIGGS TO BUILD EIGHT MOTOR

Detroit, Mich., Jan. 24—Claude S. Briggs is organizing a company to manufacture an eight-cylinder motor and details of the proposition will be announced about February 1. The factory will be located here and contracts already have been awarded for a large building to be erected at Junction avenue and the New York Central tracks. Tests of the new motor have been under way for several months and the company is planning to begin deliveries of the first motor in April. Mr. Briggs has been prominent in the motor car business for several years and will have associated with him several men who have been connected with the industry for some time.

NEW SHERIDAN LIGHT TRUCK

Chicago, Jan. 22—Numbered among the new commercial car makers is the Sheridan Commercial Car Co., with headquarters in Chicago and factories at Harvey, Ill., which is bringing out a new light commercial car to sell at \$465. It will be equipped with a 2¼ by 4-inch, four-cylinder engine, block-cast, with removable cylinder heads. The carburetor is a Carter, the magneto, Bosch, the clutch a cone and the cooling is by thermo-syphon.

The gearset is selective with two forward speeds. The rear axle is of the floating type and the car is geared 5 to 1 on high, 12 to 1 on low and 12 to 1 on reverse. The maximum speed is said to be 30 miles per hour. The wheelbase is 104 inches. In the matter of equipment is found windshield, horn, tools, Prest-O-Lite tank, headlights, delivery body, 43 inches wide, 55 inches long and sideboards 8½ inches high.

BAYERLINE & DALY'S NEW CAR

Detroit, Mich., Jan. 22—Details of the new car that is to be built by the manufacturing concern formed by J. T. Bayerline, former president and general manager of the King Motor Car Co., and W. L. Daly, who was general sales and advertising manager of the same concern, have been divulged in part. It is understood that the car is to be a six-cylinder, 3¼ by 4½, to sell at \$900 as a five-passenger. The wheelbase will be 114 inches, tires 32 by 3½. Rear springs are cantilever, the axle floating, the clutch a multiple-disk. The price of \$900 is to include a convertible top, in addition to the regular equipment.

With the Squirrel Car in Flanders

By Hi Sibley



The author and the squirrel car in a Flemish barnyard at Crombeke, Belgium

IF there is anything that will put emery in a man's good nature and cause him to regard life with a highly strabismic vision, it is to attempt to repair a car with limited tools and miles away from a shop. As repair man on the American ambulance squad in Flanders last summer, I had 10 trying weeks of such experiences. Before my service was up I had aged 10 years and nearly doubled my working vocabulary; I wore out all the English and French cuss words in existence and then started in on Flemish. And a Flemish curse is nothing to sneeze at. If a "frozen" nut won't start with a Flemish swear word, you might as well use a cold chisel.

However, before we proceed I want it understood that my woes were not due to any defects in the cars nor to indifference on the part of the manufacturer's agent in supplying tools and parts, but, as the irrepressible Frenchman always says when things go wrong, "C'est la guerre!"—war time conditions are entirely responsible.

Roads Hard on Cars

In the first place, the roads near the front were in deplorable condition with gaping "marmite" holes and deep ruts caused by the continuous passing of heavy artillery and transport trucks. Secondly, when a road is being shelled a chauffeur, for obvious reasons, is not disposed to tarry. Cars are driven at top speed nearly all the time, for that matter, which is all right as long as they stay in the road, but once they leave the narrow strip of rough block pavé of a Belgian highway and skid into the red clay at the side (it rains every 30 minutes by chronometer in Fland-

This article is illustrated from photographs and sketches made by the author while he was serving as chief mechanic on the repair car attached to the American ambulance corps.—The Editor.

ers) something happens. There are many head-on collisions, side-swipes and an occasional plunge through a bridge rail. At almost every turn in the road one sees an abandoned car flat on its back, its figurative legs helplessly clawing the air. I do not exaggerate.

Drivers Inexperienced

Incidentally, some of the boys who came to us at first were not thoroughly familiar with proper care of and minor repairing on their respective cars. At least this was my impression, for when a man puts a commutation roller on upside down and wonders why his motor kicks when cranked, or tries to make a tight joint with a lump of carbon as big as a filbert between the cylinder head and the gasket, or leaves out a valve or two when re-assembling his motor—for such reasons I am inclined to believe that some of the boys had much to learn. Perhaps I am wrong. But it must be said to their credit that they were a mighty willing lot of workers and every anxious mother's son of them became a competent repair man before he left.

On top of all these disadvantages, transportation and mails were slow and intermittent. Although we kept a large number of extra parts in the supply or "squirrel" car, we could not anticipate all emergencies and parts were slow in coming up from Paris. Consequently, it being urgent that all cars should be in commission

every possible minute, my lot was full of humps and bumps.

This repair job and charge of the squirrel car, by the way, was not wished on me. I had asked for it, and being able to discuss radiator caps and upholstery and tire pumps and other vital organs of a well appointed car intelligently, our chef de section assigned me to the place. If he showed poor judgment, that was up to him. That there were other men better equipped for the place, I knew. I wanted the place because I regarded it considerably more healthful than driving an ambulance that often had to go under fire. Personal experience in the bombardment of Dunkerque and lesser pyrotechnics in Nieuport had given me extreme distaste for any more of such. On the squirrel car, I figured, I could sit in the sun and smoke and chat and direct the work of others, and live a life of peace and ease. And I wouldn't have to dodge shells.

A Life of Vicissitudes

Idle dream! A week at it and I discovered that there would be no sitting in the sun; more often I was on my back in the dust and mud. I had little time to smoke and such chatting as I did was altogether too inflammable to publish here. It seemed that every car that required attention from me went wrong in the danger zone. Perhaps that is a bit strong, but at any rate the vicissitudes of my job made the life of the others seem drab and monotonous.

But about the repairs. On a balmy June Sunday in Dunkerque, while the others were lolling on the balcony or strolling on the Plage by the sea, I enveloped myself in one of those voluminous, baggy

brown union suits which serves a French mechanic as overalls and started in on the squirrel car, up a malodorous back alley. I made a complete inventory and it was an all day job. Just as I was washing up with pleasant anticipation of a restful evening, in burst Benny Woodworth, smeared with grease and grime.

"My car's busted down other side of Zuydecoote," he announced. Zuydecoote is 10 miles from Dunkerque.

Further explanation developed that he had broken an axle, and his car could not be towed back. It had to be repaired on the spot. There was nothing to do but go after it with the squirrel car. There were only 2 hours of daylight left; 2 hours to travel 10 miles, put in a new axle and return. And that was all right, only when we let the squirrel car down off the blocks where it had been standing some time, two tires proved to be bad, and had to be changed. You know what it means to remove old tires when you are in a hurry.

Jolt Tools Out of Place

Finally we got away with some daylight to spare; at full speed we thundered along the main road past regiments of troops, through clouds of dust, and all the time the nicely arranged parts in the car thumped and clanked and spilled from their respective places into one conglomerate pile on the floor. It was an awful mess. When we arrived we couldn't find the jacks and wheel-pullers and tools we needed most.

Benny's car had to have a complete new rear axle assembly, and he had left the

machine standing on a slope by the canal. Every time we got it jacked up it lunged over drunkenly until some bystander conceived the brilliant idea of pushing it to a level spot. It was a job! Fitting in a complete new axle in half daylight, with something like a million shuffling troops kicking up all the dust in the country, and a persistent wind carrying the bulk of it into your mouth every time you opened up to yelp at the other fellow to "H'ist on that side!" or "Let go, let GO, blank it all!"—fitting in an axle under such disadvantages is disastrous to the soul.

A Drive in the Rain

And besides, every few minutes a ponderous staff car would roar past, lurching threateningly, while we were toiling under there and I expected any minute one of them would crash into us and bump the whole kit and boodle into eternity. I took care that Benny's legs, and not mine, protruded from beneath the car. We got the thing together—eventually—but not before Benny and I had severed diplomatic relations. Both of us missed dinner, which didn't improve matters.

Now that was a mere incident compared to what came later, but I mention it to show the sort of initiation I had. The following morning—there still were cinders in my soul—orders were given for the entire squad to move over to Crombeke, Belgium, to establish new headquarters. We had to be off by nine; it was raining several kinds of cats, dogs and agricultural implements, and the trials of getting all those cars ready for the trip

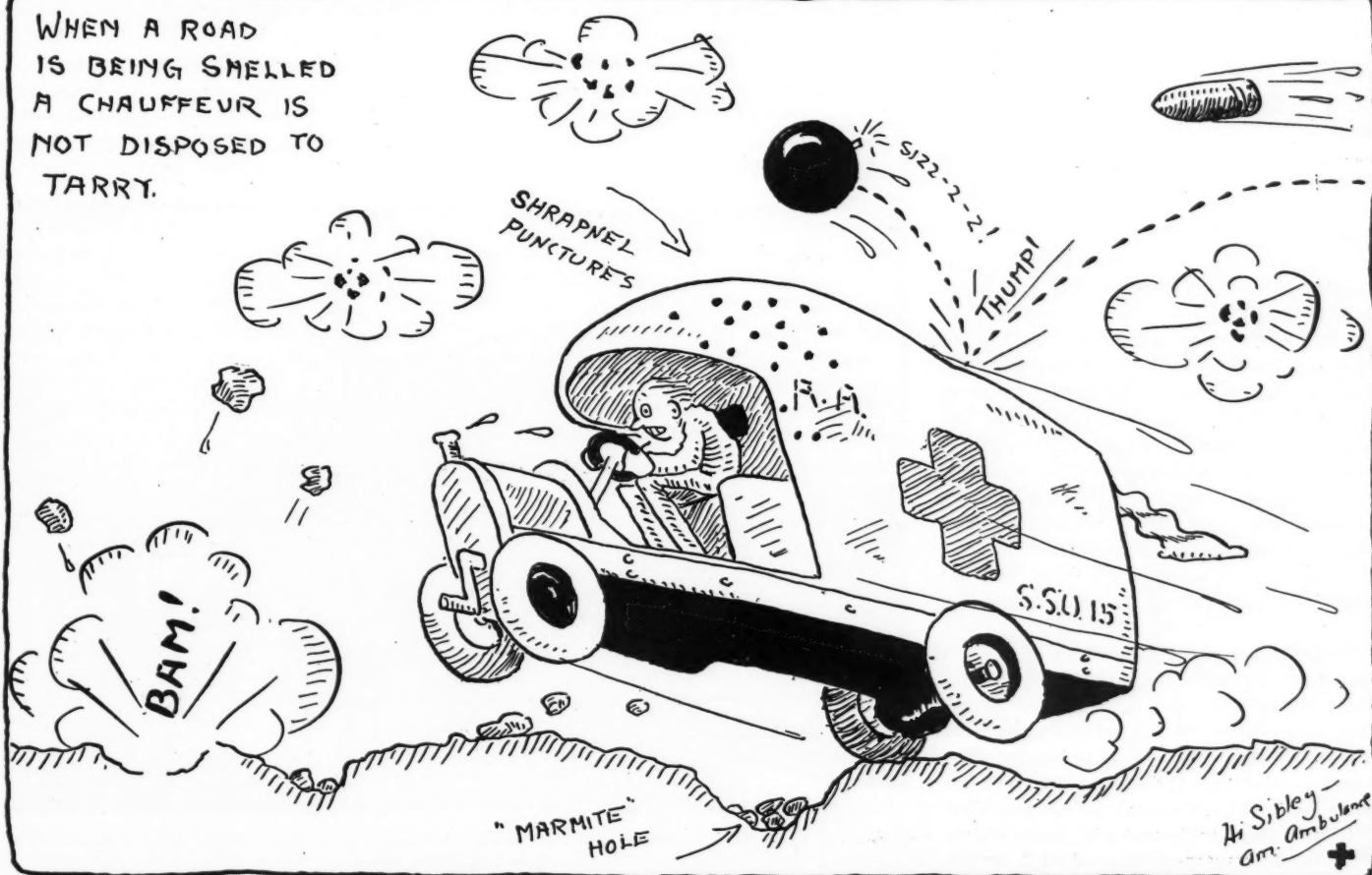
is something I prefer to forget. But we made an impressive procession, those twenty weatherbeaten ambulances with their tattered flags and faded red crosses on the side, led by the military-looking staff car and with the squirrel car bringing up the rear like a jangling exclamation point. As we rolled along the winding roads flanked with dripping poplars, the soldiers we passed waved their hands and shouted "Americaines, camarades! Americaines!"

There were only 22 miles to go, but it poured all the way. Over my seat was a canvas visor so low that I had to sit doubled up like a collapsible chair in order to see where I was going and make turns the same place the road did; the rain formed puddles in my lap and my bones ached and I longed to come in sight of the Crombeke spire. And as we did near the town the rain ceased suddenly; the sun came out and everyone was gay. Here was respite; here was food and rest.

Repairs for Three Cars

Food and rest for the others, yes; but not for me. We speeded up as we approached the town and entered in close formation. There was a sharp turn; Bud Robertson looked back to signal the others—and promptly crashed into the car ahead, pushing it into a third and presto—three cars were put out of commission! Bud's steering knuckle, among other things, was broken and of course had to be replaced before he could proceed. The two others limped into camp, and I put Bud on the list with Benny as a person to be avoided.

WHEN A ROAD
IS BEING SHELLED
A CHAUFFEUR IS
NOT DISPOSED TO
TARRY.





First aid drill of American ambulance squad. The cars are parked in barnyard in the background

The remainder of the summer, our camp was established in a barnyard just outside the village of Crombeke, a few miles from the firing line. It was a poorly drained barnyard, and I have told you how often it rains in Flanders. There was a thatched barn at one side, but it was too dark inside to work on cars. So everything had to be done in the open. We would start to take a motor down and about the time we got the cylinder head off, it would begin to rain. We would throw a canvas over it, and in the next dry interval get as far as dismounting the manifolds; then more rain. And so on. It was not encouraging work, particularly when two or three other cars were pretty sure to wobble in with damaged steering gears, or sagging way over on one side with a broken spring, before we finished the original job.

Toiling in the Mud

Thus we toiled with mud all about us; heavy, greasy mud that gummed our boots and into which small parts sank to oblivion. We were 25 miles from the nearest repair shop, the Motor Park beyond Dunkerque. There was a primitive forge in Crombeke, but outside of that scant aid we were obliged to depend on our own tools and resourcefulness. This was disconcerting at times, particularly on the occasion when we had a transmission all ready to re-assemble, and then learned that we had to go 20 miles to find a vise with jaws wide enough to force in a bushing.

Tools got lost and scattered. For a long time we were without a single Stillson wrench; a number of our most important S-wrenches were mislaid. The only solder we could get was like sugar. Once a car was laid up three days for lack of such a little thing as a valve stem pin. We could find no suitable material from which to make a temporary one. And I recall

all too distinctly when, during a valve-grinding epidemic, one of the boys returning to Paris unintentionally included our valve grinding outfit in his tool kit. It was the only one we had. Of course we made new tools, but the delay was annoying.

Epidemic of Broken Springs

It was like being out on the frontier. And yet, in spite of all this, we managed to accomplish nearly every repair that was necessary (I do not claim the credit for this myself, for I knew no more than most of the others) and we kept the cars going, after a fashion. We had to do with burned out bearings, crushed balls, scored cylinders, fractured axles, warped valves, wrecked wheels, jimmied radiators and broken steering gears, the last a

chronic affliction. These things, simple enough for a well appointed repair shop to tackle, but some of them mighty hard knots for us out there at the front. Broken springs were as common as sooty spark plugs; unavoidable "marmite" or big shell holes were responsible for many front spring breaks, for a part of the squad was on duty at night and did not dare use lights on account of proximity to the German lines. Overloading the ambulances, which often became necessary after an attack in our section, caused most of the rear spring troubles.

Lubricating Oil Poor

A great deal of our motor trouble was due, I think, to the quality of lubricating oil supplied us by the well meaning commissary. It was something like apple butter, except for the taste. Frequent cleaning out of carbon and grinding of valves became necessary, and on cold mornings the motor and clutches were so stiff and gummed that it was impossible to start many of the cars without jacking up one rear wheel. Sometimes the car would hop off the jack, with interesting results if the cranker happened to be standing in front of his mount. One of the boys actually was pushed into a stagnant pool in the corner of the barnyard before we could catch and hog-tie his assailant. If I remember correctly, this happened to him twice within a week.

Late in the summer our trials were terminated by the arrival of the energetic Freddy Bate, formerly of Chicago, chief of the mechanical staff of the American Hospital, who brought up in his saucy little roadster enough parts and tools to start a plant. Also he brought with him a skilled mechanic, a regular mechanic. It was a lively camp during his stay; cars were taken down and put together again almost in a day. Those rejuvenated derelicts began to feel their oats almost before



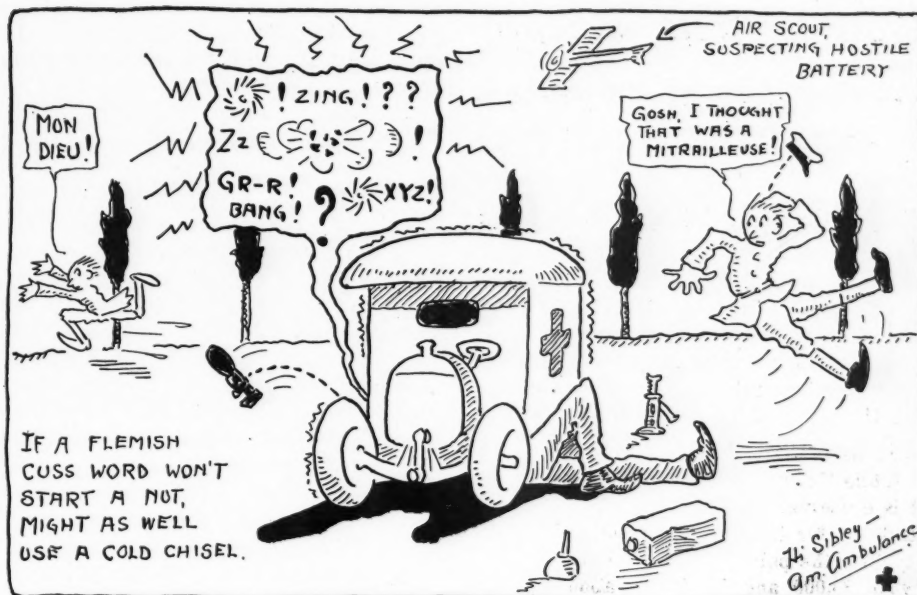
Group of American ambulance men at Cozyde, Belgium, three miles from King Albert's headquarters at La Ponne

they were out of his hands, and we had a lively time holding them in.

Although the summer was a trying one before Bate came, and seemed like just one darn accident after another to me, who was largely responsible for the upkeep of the cars, summing it all up I believe our squad, through the inspiration of Chief Roger Balbiani, was on duty individually and collectively, more consistently than any other in our section. All our boys were Americans, and an American being an adaptable sort of person, a rare standard of efficiency was maintained.

NO MORE HUPP YEARLY MODELS

Detroit, Mich., Jan. 22—The Hupp Motor Car Co. now is building its cars on the series basis rather than as yearly models, as has been its practice in the past. Hereafter the 1916 model N car will be designated as the series N, irrespective of any yearly qualifications.



Use of Motor Cars Cuts Delivery Costs in Half

Merchandising Firms of Champaign, Ill., Find Co-operative System a Great Saving After Year's Trial

CHAMPAIGN, Ill. Jan. 20—Perhaps in no city of the west has a greater measure of success been achieved in the co-operative delivery system with gasoline powered trucks than in Champaign. The system has been proven to be an economic triumph and every patron is an enthusiastic booster. No matter where the Champaign housewife buys her groceries or meats, the same service delivers her packages to her door.

It has long been recognized that one of the big wastes of the retail business is the delivery of goods to the homes of the purchasers. The average housewife no longer goes to market with her basket and carries home her purchases. She buys here and she buys there, possibly selecting the products for her dinner at different stores and orders her purchases delivered to her home. It costs real money to deliver goods under any circumstances and, when this cost is multiplied by send a number of different wagons over the same route or possibly to the same house, it becomes sheer waste.

Champaign dealers have eliminated the horse and wagon and substituted motor cars, and they also have adopted a co-operative system by which one organization delivers the goods for all. Last spring about twenty of the dealers of Champaign organized the Champaign Delivery Co. Others were quick to appreciate the advantages of such co-operation and now there are forty members with the likelihood that every dealer in the city will become affiliated in a short time. All of the leading stores are allied although the larger do not have any advantages over the smaller. The organization is perma-

nent. It is not going to fall to pieces should a few members, because of jealousy, become dissatisfied. The organization of this delivery system meant something more than a mere getting together of the dealers.

The Champaign Delivery Co. is incorporated. It has property valued at \$20,000, including grounds, buildings and motor wagons. The dealers are the stockholders, but the delivery company is, nevertheless, an independent concern doing business upon its own account. If it makes money beyond the needs of the business, it will pay dividends to the stockholders. All of the dealers, who joined the new company, turned in their old old delivery equipment. There was more than twice as much as needed in the co-operative system. All were given a valuation by appraisers and the owners were given credit for what they had turned in. The horses and wagons were disposed of, the motor trucks retained and new cars purchased. All of the cars are now of the same tint and the old names replaced by the co-operative. Ground was bought and a building erected for a central delivery station, convenient to the business district. It has something of the appearance of a railroad freight house. The station force comprises a manager, a young woman clerk, and a man to look after the vehicles. There are twenty drivers. Five deliveries are made daily, all upon a definite schedule. The housewife can have her oven hot, knowing that the meat she ordered will arrive at a certain time.

The cars leave the various stores, after picking up the packages, approximately at 7:30 a. m.; 9:15 a. m.; 11 a. m.; 2:30 p. m., and 4:30 p. m., excepting on Satur-

days when the last delivery starts at 5:30 p. m. Each wagon goes to the distributing depot, leaves the packages picked up and takes those for its particular district. The unloading and loading with the sorting, occupies 30 minutes. When the distribution has been completed and each wagon is loaded with the packages for its district, a signal is given and all start off together. Some take districts 2 miles distant.

Boxes are used to contain the packages instead of baskets. The latter are fragile while the boxes are durable and also stack to better advantage in the car, enabling a larger load. The boxes belong to the dealers and all are properly marked.

The charge for delivery, is 3½ cents an order when less than 100 pounds. Above 100 pounds, a proportionate advance is made. While a dealer is charged just as much for the delivery of a small order as a large one and he naturally seeks to make the sale as large as possible, he is now in a position to figure just how much the expense of delivery aggregates. Under the old system, he lost money just the same when a trifling order was delivered, yet he never stopped to estimate the cost and did not know how much he was out. The new system has a tendency to eliminate the 5-cent customer. An exception is made in favor of meat market men where all the packages are small, but 2½ cents are charged for such packages.

The delivery company does a strictly cash business. Tags are sold to the dealers in advance in 1,000 lots. A tag is attached to each package when prepared at the store. There are occasional C. O. D. orders on which drivers must report.

Detroit Sets Record

Previous Business and Attendance Marks Shattered During Week

Sixty Thousand Visitors Buy Most Cars Ever Sold at Show

DETROIT, Mich., Jan. 22—Previous attendance records, previous show business records, previous records of satisfied exhibitors broken! All this happened during the week of the fifteenth annual Detroit show which ended tonight.

While the final count has not been made, it is conservative to estimate the total attendance for the week at 60,000. Officials say that the paid admissions will total between 33,000 and 35,000, or about 10,000 more than last winter. Dealers stated that they sold more cars at the show retail than in any former year, and a large number of wholesale deals also were transacted, it is claimed.

Dealers Radiate Satisfaction

If the way a man talks is any indication whether he is satisfied or dissatisfied, then the appearance of most of the dealers most assuredly was one of satisfaction. And they said so most enthusiastically. Of course, there always are some exceptions. There always are some people who find only the faults to talk about, who are never pleased and who thus find some excuse for their own failure, but most of the exhibitors here had nothing but praise for the show from every angle.

As a consequence of this year's very successful show, the members of the Detroit Automobile Dealers' Association will start at once to do whatever is possible to bring about for next year's annual show the erection of the proposed exhibition building.

During the week several dinners and banquets were given in honor of out-of-town visiting dealers, by the local distributors or the manufacturer. Among these affairs were those of the Oakland,

Sparks-Withington Co., Jackson, Mich., which makes the Sparton horn, sent a delegation of some fifty department heads on a special car to attend the show and tendered them a banquet followed by a theater party. The local branch of the Buick Motor Co., had all of its forty-six state agents here. The King and Dort distributors also had most of the agents from their territory come to the show. An exhibit was made by the good roads committee of the Detroit Board of Commerce, at the show, the first exhibit of its kind at any motor show in America. This exhibit was made on a platform and drew so much attention that the people filled every inch of available space practically all of the time. That the exhibit was interesting was attested by the questions asked of the attendants.

WILL BUILD IGNITION SYSTEMS

Detroit, Mich., Jan. 21—The first product to be placed upon the market by the Detroit Engineering Products Co., which was incorporated during the week, will be an ignition system for Ford cars, utilizing the current from the Ford magneto and breaking it in such a manner as to give the same effect as though a high-tension magneto had been installed on the car, it is stated by the company, and the price to be about half that of a high-tension magneto.

This new concern has its plant and laboratory in South Bend, Ind., but will transact the general sales end of the business from Detroit. Interested in the company, which is capitalized at \$60,000, are Earle Welborn, assistant to President Henry B. Joy, of the Packard Motor Car Co., formerly for several years commercial car manager of the Dayton Engineering Laboratories Co., Dayton, O.; Austin F. Bement, in charge of the national headquarters of the Lincoln Highway Association, Detroit, and formerly advertising manager of the Electric Auto-Lite Co., Toledo; Charles A. Mattison, formerly of South Bend, Ind., an accessory salesman, and who will have full charge of the active management of the concern.

Easy Come; Easy Go

DuPont Employes Woo War Brides; Then Buy Expensive Cars

Wilmington Dealers Find Powder Workers Good Prospects

WILMINGTON, Del., Jan. 24—One thing standing out pre-eminently in connection with the second annual motor show in this city, held here all last week, is the fact the entire Delmarvia Peninsula is under the influence of an unprecedented wave of prosperity. So great has been the demand for cars that dealers have found it impossible to make immediate deliveries.

The show was held in the lobby and Green Room of the Hotel duPont. The sales of cars were between 30 and 40, and including prospective customers the number will greatly exceed that amount.

The most remarkable fact in connection with the industry here is that 75 per cent of all high grade cars sold are to the duPonts or their employes. Taken altogether, and including all makes, the duPont people consume approximately 25 per cent of all cars sold in the state. Since the war started these employes have become unusually prosperous and in numerous cases those who, a little over a year ago, were nothing more than clerks and mechanics at a moderate salary are today worth many thousands of dollars.

It is related of a clerk that he looked over a high-priced car and asked the dealer to defer the actual sale for several months as he had put some of his savings into duPont stock. The very next morning he appeared at the salesrooms and said he would take the car as soon as it could be delivered as the value of his stock went up over night.

It is estimated that the attendance at the show was about 100,000. No admission was charged. President J. H. Nixon, of the association, states that in Delaware there is a larger percentage of high-grade cars than in any other state in the Union. He substantiated this statement by saying that the per capita wealth of Wilmington is greater than any other American city.

TEST DIMMERS IN MASSACHUSETTS

Boston, Mass., Jan. 22—A demonstration of the new headlight law in Massachusetts was given January 18, before Chief Justice Aiken, of the Superior Court, and thirty justices of the superior and municipal courts in the state, at the rooms of the Massachusetts Automobile Association.

An official of the state highway commission explained the requirements of the law, which specifies that the light must be such as to enable the driver to see objects clearly 150 feet ahead and yet send no dazzling rays more than 3½ feet above



Good roads exhibit of Detroit Board of Commerce at the Detroit motor show

the ground, and at the same time must be sufficient to enable the operator to see objects 10 feet on either side of the car 10 feet ahead. The official declared that the regulation is the only one in force in the country that is workable. It was adopted in response to a general demand from motorists and will be readily complied with.

Superintendent Chamberlin, of the association, gave several demonstrations. A space 150 feet long and about 40 feet wide, covered with tar, had been prepared to represent a roadway. Along this the various types of dimming devices were shown, but no comments on the efficiency of the lamps was made officially, it being left to the spectators to judge for themselves.

Otto Lyties, New York, and Lewis H. Stern, Philadelphia, explained different systems of light dimmers.

It was announced that the National Automobile Chamber of Commerce and the Automobile Legal Association probably would construct a shadow box, where motorists may test their lights.

SENATOR SCORES FARMER-MOTORIST

Aurora, Ill., Jan. 24—Senator C. C. Pervier, speaking before the Kane county farmers' institute, said that one reason there is so little live stock to be seen upon the farms of Illinois of late years, is the fact that the farmers have sold their stock and invested in motor cars and tractors.

"The farmers sell their stock to secure money for the machines," he said, "and then spend the rest of it for gasoline, neglecting to put any money back into live stock. One man that I know refused to sell a cow and a calf for \$50, but insisted upon receiving \$52. The dealer, who finally bought the animals inquired why he held out for the extra \$2. He was informed that he needed a set of new tires which cost \$52.

"The country is nearing the point when it will not be able to feed the people."

YELLOW CAB NOVELTY TO VISITORS

Chicago, Jan. 24—The 250 "canaries" of the Yellow Cab Co. proved a surprising novelty to out-of-town visitors to the show who saw Chicago's yellow cars for the first time.

John Hertz, general manager of the Yellow Cab Co., promises 600 cars in Chicago within 16 months, giving Chicago the largest taxicab fleet in the world. "It has been impossible," he says, "to keep step with the passenger demand for these cabs. Our factory has been working night and day in an attempt to meet requirements right here in Chicago. Our branches in Kansas City and San Francisco are burning up the wires for more cabs. Within a year Yellow Cab service will be established in every important city."

The success of the yellow cab is laid in part to low rates—30 cents a mile—and to the unique yellow coloring which flags the fare's attention.

Favor Tagging Change Many Congressmen Cham- pion Adamson Regis- tration Measure

Motorists May Be Able to Travel Anywhere On One License

WASHINGTON, D. C., Jan. 24—Many members of both branches of Congress unhesitatingly have expressed themselves in favor of the Adamson registration bill which provides that a motorist with his home state number can travel freely anywhere in the United States without additional taxation.

A. A. A. state and local clubs throughout the country, in asking the support of their spokesmen in Washington, have been gratified at the practical unanimity of the replies received.

Commenting upon the change of public opinion, President John A. Wilson says: "Of course the fact alone that the A. A. A. now speaks in organized form for over two and a quarter million road users, with another million in sight before the close of the present year, as against less than a hundred thousand ten years ago, tells its own story. The self-propelled vehicle is an accepted necessity and economically has its place.

"I believe that the time is nearer at hand than most of us realize when Representative Adamson's prophecy will be realized and that it will be only the operator and not the vehicle calling for a number. His number will be displayed on whatever vehicle may be in charge of the operator, who will be subject to an examination sufficient to demonstrate his ability to handle a motor car under diversified traffic conditions.

"In the country districts which are absorbing the greater part of the motor cars now being produced there is a growing dissent at the multiplying increase of vehicle taxation. Some day soon the motor car will be taxed like any other piece of property, for roads confer a general benefit and should be paid for out of general funds."

GASOLINE PRICES RAISED AGAIN

New York, Jan. 22—Despite the inquiry started by the department of justice and protests laid before the Federal Trade Commission, gasoline companies in Illinois and other states have announced another raise in prices. The Texas Co. has advanced the price of gasoline, tank wagon basis, 1 cent a gallon throughout the Illinois, Minnesota and Missouri territory. The Standard Oil Co. is expected to meet the advance. The wholesale or tank-wagon price of gasoline, fixed by Standard Oil of Ind., has been 16½ cents, just 1 cent below the Texas Co.'s price. At filling stations

of this company, the retail price of 18½ cents has been in effect 3 weeks or more. Gasoline at 24 cents a gallon has been predicted for the last of this month.

Prices have been advanced 2 cents a gallon in Texas. The Magnolia Petroleum Co. and Pierce-Fordyce Oil Association, and the Bonner Oil Co. have advanced the price, tank-wagon basis to and at filling stations 2 cents a gallon, to 19 and 21 cents, respectively. Kerosene prices have been advanced 1 cent a gallon, to 12 cents. Neither Gulf Refining nor the Texas Co. has raised the prices to meet the new schedule, but both companies are expected to do so before the end of the week. The Texas Co. has advanced prices, tank-wagon basis, in that state, 2 cents, to 21 cents, and the wholesale price of kerosene 1 cent a gallon, to 12 cents.

South Carolina prices, tank wagon basis, have been advanced 1 cent a gallon, to 23½ cents minimum, and 25½ cents maximum. The Texas Co. has announced an advance of 1 cent a gallon in St. Louis, to 18 cents, at filling stations. The Independents in Kansas City have raised the prices, tank-wagon basis, 1 cent to 15.8 cents a gallon. The Standard's price is unchanged.

BURR LEAVES WOODS VEHICLE

Chicago, Jan. 25—Information has just become public that Louis E. Burr, for many years at the head of the Woods Motor Vehicle Co., has severed his connection with that concern. Mr. Burr resigned early last November.

"I left the Woods company selling out my interest nearly 3 months ago," said Mr. Burr today, but it was a part of my agreement not to make the matter public. The company was planning a new car and it was thought best not to announce my retirement from the organization."

Mr. Burr now is engaged in the bond business in Chicago.

RULE AGAINST MINNESOTA OIL

St. Paul, Minn., Jan. 24—On the ground that oil brought into Minnesota is for the use of citizens, who are entitled to protection of the state oil inspection law, the supreme court of Minnesota has upheld the law covering the case. The attack was made by the Bartles Oil Co., which held back \$794.80 for inspection fees in the first 9 months of 1914. This will be paid as well as about \$20,000 from other companies which agreed to stand by the decision. The plea was that the inspection law was a revenue measure and a tax on interstate commerce unlawfully placed.

It was shown by the court that from 1903 to 1913 the average expense of the department was 82 per cent of the inspections revenue, and that this did not include bookkeeping by other departments. In addition it was pointed out that the last legislature reduced the cost of oil inspection, thus tending to diminish the revenues therefrom.

Every Day is Moving Day if You Own a House on Wheels

Dayton Motorist Touring to Florida in Winter Home He Built on Ford Chassis

If any thrall of an insistent and grasping land doubts that it is "cheaper to move than pay rent," he should have a heart-to-heart talk with Clarence A. Lindsey, of Dayton, O., and have such an idea thrown into reverse.

Every day is moving day with Lindsey, if he so chooses, for he has a home that travels with him. By the use of a Ford chassis, \$150 worth of materials and a staggering amount of ingenuity, he has converted a motor car into a tire-shod house.

Several Problems Solved

Such a house solves any number of vexing problems for its owner. If he and his wife wish to go to the movie theater on the maid's night out, they put the baby to bed, drive to the playhouse of silent drama, ask the ticket seller to watch that no car thief steals both sleeping child and house and then enjoy an hour and a half of Mary Pickford or Blanche Sweet. Should the children next door have scarlet fever, he merely cranks up his residence and goes to a locality outside the zone of contagion. When the servant announces that she will quit if she doesn't get a week's vacation, all he has to do is take her for a tour and she cooks the meals en route.

In his restless residence on wheels, the Dayton man now is touring to Sunny Florida, accompanied by his wife and Mr. and Mrs. James A. Kirk. The Lindseys have no winter home at Palm Beach, Daytona or Miami. They take it with them.

"Why pay \$35 a month for a three-room

apartment when gasoline is selling for 21 cents a gallon?" is the question that Lindsey has fired at thousands who pay tribute to owners of flat property.

Even if the three-room apartment has a disappearing bed that serves as a bookcase during the daytime and an ice box and a graphophone combined, it has nothing on Lindsey's house on wheels, which can be converted from a one-room to a three-room residence in 5 minutes time, a feat only equaled by the genii of Aladdin's lamp.

The secret of this seemingly marvelous transition is found in the special body for the car which is of the folding variety. When closed and ready for touring, it forms one room, 8 feet long and 5½ feet wide, but at night or on a stop of any duration, the sides are unfolded and the floor extended, making a wing room on each side of the main room, each measuring 7 feet in length and 3½ feet in width. The top also is raised 18 inches, making the car 7 feet in height and insuring the residents against cranial bumps. The floors for the two wings hinge together and, when not in use, are folded on the running board.

Two Sleeping Compartments

By making use of the extension body, two comfortable sleeping compartments, each accommodating two persons, are provided. The seats and cushions of the car, when arranged for sleeping, are adjustable and similar to those of a Pullman.

The main room of the house on wheels is used either as a dining room or library.

Their table is placed between the front and rear seats and when not in use, is part of the floor. In one corner of the car is a shelf for books; in another, a tank for ice water. There is a drop lamp for reading and two ceiling lights, current for which is supplied by a dynamo that is located under the hood of the car and fitted with a double switch that permits the use of the magneto with the dynamo. The windows of the car are arranged so that they can be dropped for ventilating purposes and an air-sweet system for disinfecting and perfuming the house has been installed.

Water Heated From Exhaust

For supplying hot water, there is a 6-gallon reservoir, the water of which is heated by running a coil from the exhaust pipe through the tank. The gasoline tank is located under the seat and the heat generated while the car is in motion is utilized to warm the moving house.

A folding stove, with oven and two burners, fits snugly in a special box at the rear of the car and provisions and supplies of all kinds are stored away in several small cupboards built in the sides of the body.

Clothing is hung on a hook over the door. Clothes hangers are provided; also covers to protect the suits and dresses from the dust.

The interior of the car is painted terra cotta while the seats, trimmings and window curtains are tobacco brown. The outside of the body is finished in dark gray with running gears, standard black.

AND I LEARNED ABOUT MOTORS FROM THAT

By Ernest Douglas

I've had my troubles with motors;

I've tried 'most all makes in my time;

I must have owned twenty or thirty,

And four of the lot were prime.

One was a battered Flivver,

One was a Sloopkart green,

And one was a Crock (though it always would knock),

And one was a Smoke machine.

Now I am no Selden or Coffin

And Henry Ford isn't my name;

And Marmon or Briscoe or Flanders

Might give me some points on the game.

There's times when 'most any car's lovely,

There's times when the finest will stall;

But the more gas you burn the more things you'll learn,

And don't ever think you've learned all.

The first one I had was a Complex,

A junkheap of scrap-iron and tin;

On high it ran four miles an hour,

The whole thing was ugly as sin.

It scared all the brutes on the highways,

It frightened the dog and the cat;

When the thing wouldn't start I would take it apart,

And I learned about motors from that.

Then I switched off to a Corker;

The engine was under the seat;

I steered with a sort of a handle,

And shifted the gears with my feet.

I started one Sunday for meeting;

The tires on four wheels went flat,

And parts fell away like the old one-horse shay,

And I learned about motors from that.

I traded it off for a Bullet

That lasted me almost a week.

An Eiswaggin wasn't much better,

And I soon drove it into a creek.

A Barker proved noisy and smelly,

But it wasn't as fast as the Scat.

I ran my new Ghost 'gainst a steel hitching post,

And I learned about motors from that.

I've never left cars as I found 'em,

The most I've torn down and rebuilt;

I alter the shape of the pistons,

Or set the magneto a tilt.

And the end of it's sitting and wishing

You'd let the whole shooting match be;

So be warned by my lot (which I know you will not),

And learn about motors from me.

The Barker's old engine kept knocking,

The reason no one ever knew;

The Sloopkart insisted on jumping—

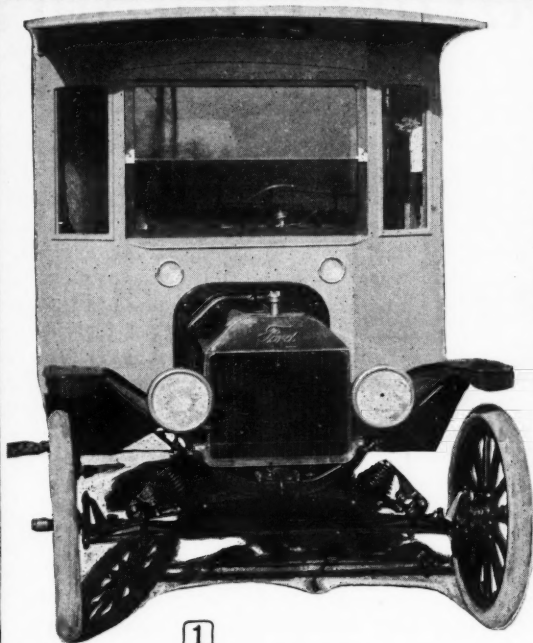
Its wheels hardly ever were true;

But when they get to the cop on the beat,

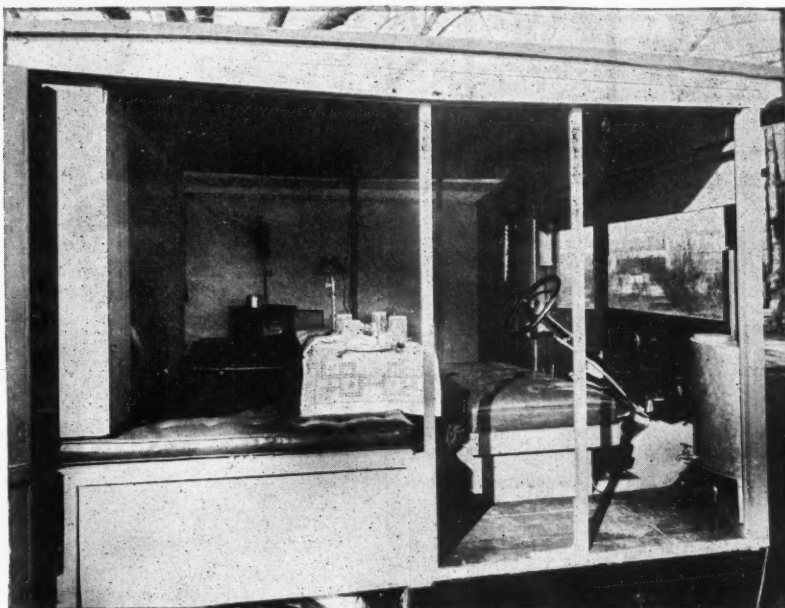
They're like as two rows of pins.

He'll swear that you're speeding, the limit exceeding,

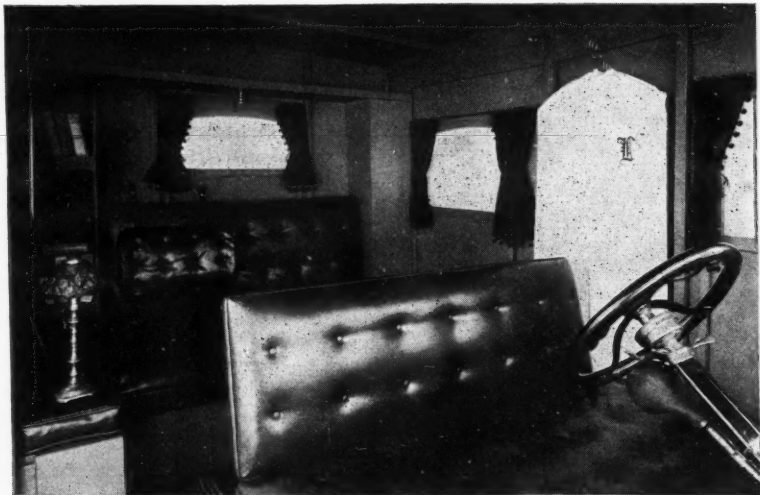
And in arguments he always wins.



1



2



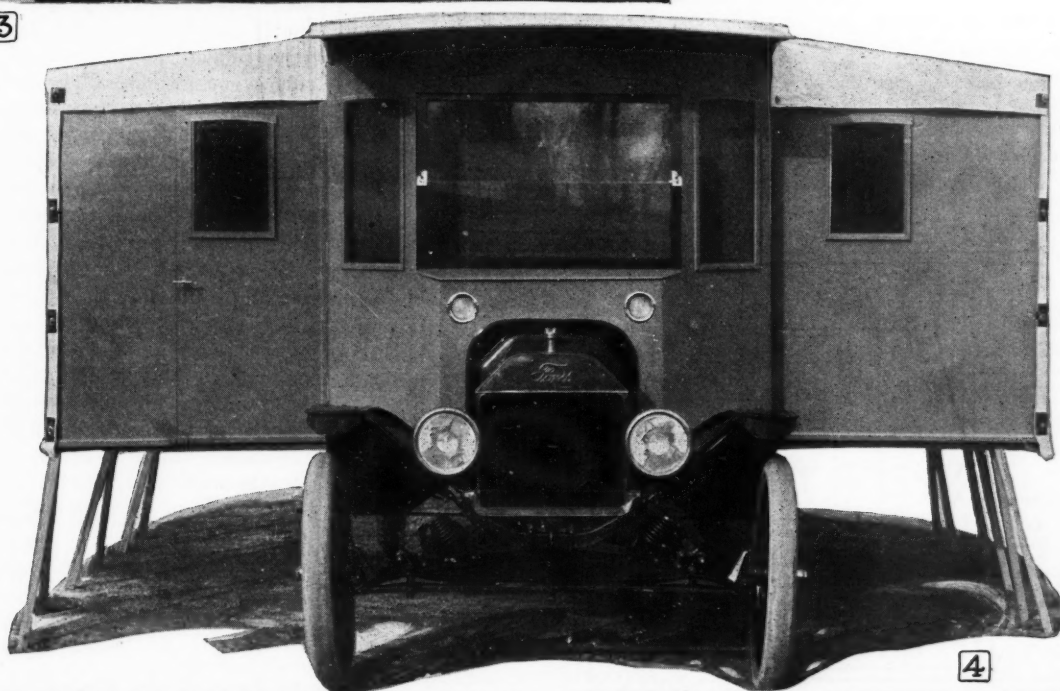
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1—Unique house on wheels, built by Clarence Lindsey, of Dayton, O., ready for a day on the road.

2—The dining room of the motorized home. The collapsible stove is set up in one of the wing rooms and the table, which forms part of the floor when not in use, is set for luncheon. Note tank for drinking water in one corner of the car.

3—The library of the house on wheels. There is a shelf for books and a drop lamp by which to read. The clothes of the tourists are hung on hangers and protected from the dust by covers, bearing the initial of the car owner.

4—The motorized home converted into a three-room house by unfolding the sides and extending the floor, making two compartments for sleeping.



4



The Readers' Clearing House



WANTS TO REPLACE METRIC PLUGS Would Be Quite a Job to Tap New Holes in Cylinders

CEDAREIDGE, Colo.—Editor Motor Age—I have a Packard model N which uses metric plugs. Would I get more satisfactory results to tap out the holes and use A. L. A. M. or 1/2-inch plugs?

2—The pistons and connecting rods on the Packard weigh 7 pounds 13 ounces each. Would Motor Age advise putting in aluminum pistons and lighter connecting rods? The pistons and wristpins weigh 4 pounds 1 ounce each.

3—Where could I get a crankshaft heat-treated for crystallization?

4—Would Motor Age advise having a broken crankshaft welded by the Oxy-Acetylene process?

5—Is a model A No. 2 Stromberg carburetor suitable for a four-cylinder motor with a bore of 4 1/2 inches and stroke of 5 inches?

6—Give the name and address of some companies making the lightest and most durable one-unit lighting and starting systems.—A Subscriber.

1—We do not see how there would be any different results using either size as compared with the other. The plugs are made the same way, and whether they are metric or standard should make no difference in their performance. It would, perhaps, be easier to obtain the 1/2-inch plugs, but it is doubtful if this would offset the trouble of tapping the holes for them.

2—The pistons could be of aluminum very satisfactorily, but it would be best to use the rods you have.

3—Any plant that has a heat-treating department ought to be able to take care of this for you. Otherwise you could ship the shaft to the factory.

4—No. It is doubtful if it would be strong enough for the service, and it would also be extremely difficult to join the parts with sufficient accuracy to bring about proper alignment between the bearings.

5—A Stromberg model A-2 would be suitable, but this is an old model. An H-2 would be better.

6—Dayton Engineering Laboratories Co., Dayton, O.; Apple Electric Co., Newark, N. J.; Bosch Magneto Co., New York; Detroit Starter Co., Detroit; Disco Electric Start-

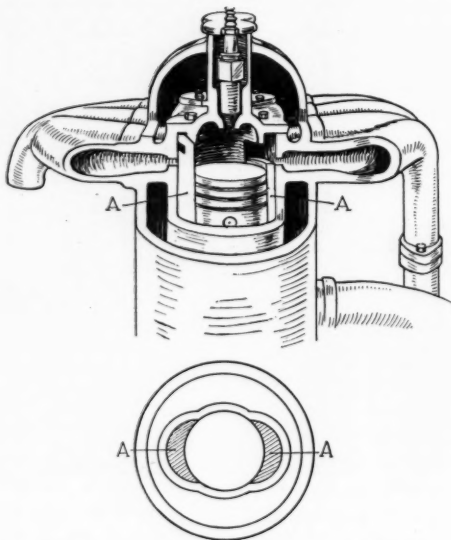


Fig. 1—Cutout view of Fischer crescent-valve engine with sliding valves shown at A

er Co., Detroit; Dyneto Electric Co., Syracuse, N. Y.; Electric Auto-Lite Co., Toledo, O.; General Electric Co., Schenectady, N. Y.; Gray & Davis, Boston; North East Electric Co., Rochester, N. Y.; Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.

BUILT-UP CRANKSHAFTS COMMON Maxwell Racing Engines Have An Example of Two-part Crankshaft

Clinton, Mass.—Editor Motor Age—Are built-up crankshafts for multiple-cylinder high-speed motors, such as three-bearing four-cylinder or four-bearing, four-cylinder motors ever made; and, if not, could they be expected to stand up under such service?

2—Is semi-steel a suitable material for pistons and cylinders?

3—Would cast-steel connecting-rods be durable under such conditions, allowing a fiber stress of 5,000 pounds if they were thoroughly annealed?

4—Is there a formula giving the resisting moment of square and rectangular sections under torsional strains?

5—What power would be required to crank a six-cylinder engine of 3-inch bore 4 1/2-inch stroke, 70 pounds compression, at 250 r. p. m.?—N. M. Baldwin.

1—Built-up crankshafts sometimes are

made, and there is no reason why such a design would not be as strong as any other if properly constructed for the service. An instance of a two-part crankshaft is that in the Maxwell racing engines, the shaft being split into two parts to allow a ball bearing to be mounted in the center. The way this shaft was put together there was no doubt of its strength. The main objection to them in motor car construction in any case would be the added time it would take to make them, and there is no advantage.

2—Yes.

3—Cast-steel rods would work satisfactorily, although they are not as strong as forgings. Remember that all the working force has to be borne by the rods, and they must be very strong and light.

4—Multiply the force in pounds by the arm in inches, this giving you the torsional moment in inch-pounds.

5—About 0.7 horsepower.

PROCESS OF VALVE REGRINDING Why It Is Necessary to Alternate the Motion in Grinding Valves

Parkersburg, W. Va.—Editor Motor Age—Kindly explain why valves are reground by alternating rotary motion, in view of the fact that valve tappets are arranged to give the valves a slightly continuous rotary motion in service.

2—What are the objections to the continuous rotary motion in regrounding?

3—Describe the Fischer slide valve engine and illustrate it.—L. O. Martin.

1 and 2—Valves are ground by an alternating rotary motion to avoid scoring the seats or the valves themselves. You know that if you were sandpapering a finely finished piece of wood, such as an automobile body, preparatory to painting it, you would not draw the sandpaper around in a continuous path, for that would leave ridges or scratches. The same applies to grinding in valves.

3—In the Fischer motor, or Magic motor, as it is called in this country, the valves are of sliding form, but they do not go all the way around the piston, as in the Knight motor. Instead, the sleeves are crescent-shaped, and the exhausts on one side and intakes on the other. Two eccentric shafts move them up and down, and register slots in their upper ends with openings in the cylinder wall. The construction may be seen from Fig. 7, which is a section through the end of the engine. The sliding valves work in slots A in the cylinder wall.

Diagram of Maxwell Electrification

Clovis, N. Mex.—Editor Motor Age—Kindly publish diagram showing the lighting and ignition system of the 1915 Maxwell 25.

2—The magneto does not distribute a very strong fire to the plugs. At times I can start the motor with ease, then again I have a hard time starting it. What seems to be the trouble?—Reader.

1—This wiring diagram is shown in Fig. 3.

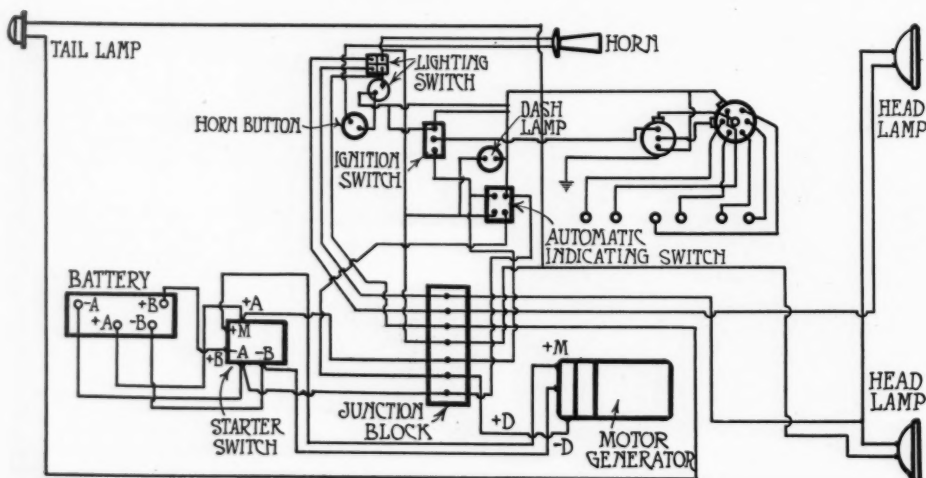


Fig. 2—Wiring layout of Mitchell six of '16

2—Probably the magnets have become weak. Take the magneto to a repair shop that knows how to do the work and have the magnets renewed. If there is no shop in your town where this can be done, ship the magneto to the factory.

ADJUSTING ALPCO CHARGING SPEED Time of Beginning to Generate May Be Made Earlier or Later

David Lake, Neb.—Editor Motor Age—What make of car is Bergdoll's Erwin Special?

2—At what speed in high does the Apico generator on the Mitchell Six of '16 reach its full charge?

3—What causes sparks to appear in the brush holder assembly when the throttle is opened about half way? Is this harmful to the generator?

4—When the three end screws in the Apico generator are loosened the brush holder can be moved back and forth. What is the object of this?

5—Publish a wiring diagram of the Mitchell Six of '16.

6—What is the highest speed of the Mitchell Six of '16? The Overland Six?—A Subscriber.

1—Many of the features of the Bergdoll Special are Benz, but this is a special job made by Erwin Bergdoll.

2—When the car is running from 12 to 15 miles per hour.

3—The sparks probably originate from a dirty commutator or from improper brush adjustment. This should be remedied at once.

4—This is to make brush adjustments and cut the charging in earlier or later.

5—The wiring diagram is shown in Fig. 2.

6—The maximum speed of the Mitchell Six of '16 is better than 60 miles per hour, and that of the Overland Six is given as 55.

Wants to Fit Larger Brake Drums

Cloverdale, Cal.—Editor Motor Age—I have been having brake trouble, due to too small brake drums on my 1910 Cadillac, which is fitted with Timken axles. The drums are only 12½ by 2 inches and are much too small for a 3,000-pound car in this mountainous country. I want to equip it with 16 by 2 or 2½ brakes and can see no reason why I cannot if it is possible to obtain a pair of this size drums bored for 2-inch hubs. What does Motor Age think of it, and has it any suggestions to offer? If I can obtain the drums, shields and bands I can do the fitting and think I can work over the old brake connections without much expense.—H. W. Pierson.

It would be entirely practical to do this, although we do not know where you could get such a set of drums already made. It is probable that you would have to have them made to your order. Remember that you do not want to get them so large that they will interfere with the road clearance of the car.

Warm Water as Carbon Remover

Metropolis, Ill.—Editor Motor Age—Does Motor Age recommend removing carbon while the engine is running by means of warm water slowly fed through a primer connected to the intake manifold?—R. LaFont.

We do not believe that this would have very beneficial results, although it would do no harm. Warm water would not serve to dislodge much of the deposit.

Function of Universal Joint

Brooklyn, N. Y.—Editor Motor Age—What is a universal joint and for what is it used?

2—What is the horsepower, gear ratio and speed of the Moon 6-40?

3—I have a Pierce four-cylinder motorcycle engine for a cyclecar which I am building. Which is the best, chain or belt drive for this car?—Charles E. Hill.

Communications Received and Inquiries Answered

A Subscriber.....Cedaredge, Colo.
L. O. Martin.....Parkersburg, W. Va.
N. M. Baldwin.....Clinton, Mass.
A Subscriber.....David Lake, Neb.
H. W. Pierson.....Cloverdale, Cal.
Charles E. Hill.....Brooklyn, N. Y.
R. LaFont.....Metropolis, Ill.
C. C. Harry.....Mt. Summit, Ind.
Dr. Edward Sharp.....Belleville, Kan.
Monza Friesner.....Meadville, Mo.
R. Dumas.....St. Casimir, Que.
C. L. Morgan.....Osco, Ill.
J. Connell.....Chicago
Delmar Gooch.....Ellsworth, Minn.
W. N. Dolby.....Mount Morris, Ill.
Reader.....St. Louis, Mo.
H. E. Davis.....St. Louis, Mo.
William Moser.....Council Bluffs, Ia.
F. Carter Turner.....Middleburg, Va.
W. B. E.....Peoria, Ill.
Reader.....Clovis, N. Mex.
J. F. Tancig.....Hibbing, Minn.
A Reader.....Canton, Nebr.
L. W. Plummer.....Olney, Ill.

Communications which are not signed with the inquirer's full name and address will not be answered in this department.

1—A universal joint is a connector between two shafts allowing them to operate at any angle to one another within practical limitations.

2—The horsepower of the Moon 6-40, according to the N. A. C. C. formula is 29.4; the gear ratio in third, 4 to 1; and the speed 55 miles per hour.

3—We cannot say which is the best drive, but if you will write the makers of the various types, you can doubtless decide for yourself.

FEATURES OF THE 1916 WESTCOTT Wiring Diagram, Speed Changes, Spark and Throttle Lever Data Wanted

Chicago—Editor Motor Age—Kindly illustrate the Delco wiring system as used on the 1916 Westcott car.

2—Describe the different speed changes.

3—Describe the spark and throttle retard on segment of the steering post.

4—Does this car use the one-wire system?

5—What speed should this car travel before charging the storage battery?

6—Is the Gemmer considered the best steering gear in use today?

7—What form of drive does this car use, and explain its principle and action?—J. Connell.

1—This is shown in Fig. 5.

2—Fig. 4 shows the positions of the speed change lever for reverse, first, second and high gear.

3—Fig. 4 indicates the position of the

spark lever for highest advance, lowest retard and steady running. The throttle advances are from the bottom upward.

4—Yes.

5—About 10 miles per hour.

6—The Gemmer probably ranks among the best of steering gears.

7—Spiral bevel gear. This is shown in Fig. 7.

WINDING OF MAGNETO ARMATURES Wide Variation in Amount of Wire Used—Also in Voltage and Amperage

Meadville, Mo.—Editor Motor Age—What is the size of wire used on the armature of most magnetos, and how much wire is used?

2—What is the voltage of a magneto, and the amperage?—Monza Friesner.

1—Some authorities advise the use of ½ to ¾ pound of No. 26, double cotton-covered wire. Of course the amount and size differs. As an indication of the width of variation it may be said that in the line made by one magneto manufacturer, which includes 300 or more, not more than half a dozen have the same windings. This is a matter upon which the magneto maker very reluctantly gives information.

2—Voltage varies from 8,000 to 30,000 and there is a great difference in amperage also, the low-tension having a greater amperage than the high-tension.

No Way of Telling Best Engine Type

Belleville, Kan.—Editor Motor Age—Which car will run the fastest, a four, six, eight or twelve-cylinder car of the same weight?

2—Size of wheels, gear ratio, cylinder displacement, and everything being equal, which is the speediest and most efficient motor, and why?—Dr. Edward Sharp.

1—That depends entirely upon the design and mechanical excellence of the car. Two motors of exactly the same type and size might have very different performance for the reason that one was better designed than the other. So there is no basis for comparison.

2—The remarks above apply to this question also.

This Sounds Like a Spark Knock

Mt. Summit, Ind.—Editor Motor Age—My 1914 Detroit four knocks and pounds on a pull with retarded spark. It misfires when the current indicator begins to fluctuate. A new coil and platinum points have been installed. Is it possible that the relay is not right? The battery stands up well. Could it be a spark knock, and, if so, what is the cause?

2—Would raising the block ¼ inch benefit it or would it lower its power?—C. C. Harry.

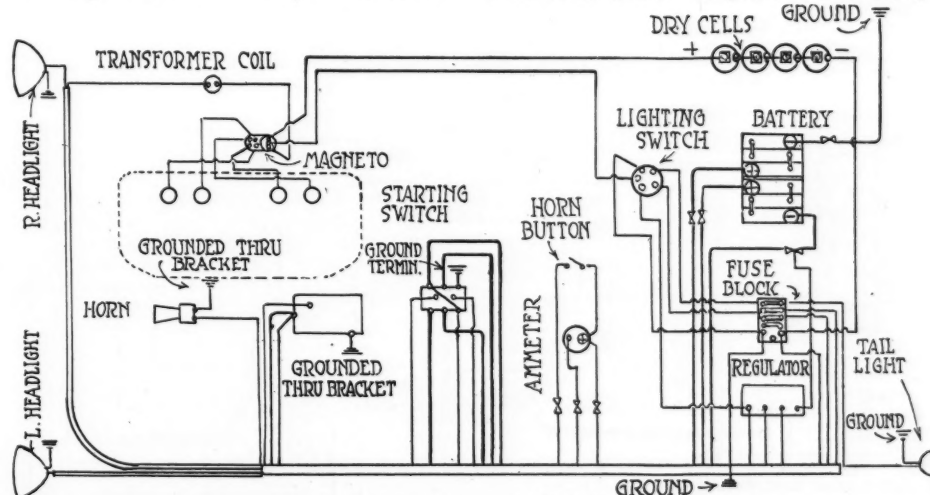


Fig. 3—Wiring diagram of 1915 Maxwell 25

1—This is probably a spark knock. You probably have the spark retarded too far. Try advancing it a little more on such a pull. There may be a great deal of carbon in the engine. It would be well to examine the spark plugs to see that they are not sooted.

2—Raising the cylinder block would give you more space in the combustion chamber, thus reducing the compression, and consequently the power output.

SPLITDORF USED ON OVERLAND 83 Reader Also Wants Data on Steam Car Manufacturers

St. Casimir, Que.—Editor Motor Age—What kind of high-tension magneto is used on the Overland model 83?

2—What are the prices in the United States of the following Bosch high-tension magnetos: Bosch N. U. 4 and Dual for four-cylinder engines?

3—Give the names and addresses of a few makers of steam cars.

4—What is the price of the latest model of the 30-horsepower Stanley steamer?—R. Dumas.

1—Splitdorf.

2—The N. U. F. lists at \$40 and the dual with coil at \$77.50.

3—Stanley Motor Carriage Co., Newton, Mass. This is the only American company now making steam cars.

4—\$1,975.

Front Tire Wear

Osco, Ill.—Editor Motor Age—Which will wear the longest, the right or left front tire under ordinary conditions?—C. L. Morgan.

There will be very little difference in the wear of the two front tires. The fact that the driver usually sits on the left side and frequently is the only extra weight in the car would tend to cause slightly more wear on the left tire. On the other hand, the fact that most of the turns are made to the left, when turning around, would cause the right tire to travel the greatest distance, and, on this basis, it would wear more quickly. Taken all in all, the wear is about equal, in ordinary cases.

Air-Cooling the Ford

Ellsworth, Minn.—Editor Motor Age—In a thermo-siphon, such as used in the Ford motor, why cannot one cool it by forcing the air in at the bottom hose connections and allowing

it to come out of the top hose connection, with the radiator removed, provided sufficient air is forced through.—Delmer Gooch.

The arrangement you mention should be successful provided sufficient air could be forced through the cooling system. However, it would be impossible to force air through rapidly enough to keep the exterior of the cylinder walls cool, as the metal within the jackets is not of such shape as to transmit the heat from the metal to the air rapidly enough, nor would the jackets be able to carry a sufficient volume of air.

PROBABLY THIS IS A SPARK KNOCK Tapping at High Speed Suggests Possibility Spark Needs Advancing

St. Louis, Mo.—Editor Motor Age—What would be the cause of a knock in a 1915 6-40 Hudson which is a light tapping sound and can only be heard at speeds of 30 miles per hour or above. Apparently it is in the camshaft or valves, as it seems to occur once every two revolutions of the motor.

2—Are the valves on this car of tungsten?

3—About what is the average mileage obtained before regrinding is necessary?

4—How are the timing gears on this car lubricated?

5—Does the Hudson factory supply axle gears with a 3 to 1 ratio for this model?

6—On this car a slight rattle is heard when going over sharp bumps and seems to be in the joint between steering wheel and steering rod. Removing shims at bottom of steering gear case does not alter this. Would this be caused by the key holding wheel to shaft being worn?

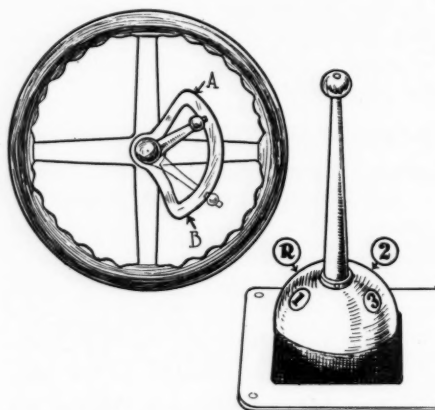


Fig. 4—Control features of Westcott. At left, spark lever positions for steady running with full advance at A and retard at B. At right, gear position

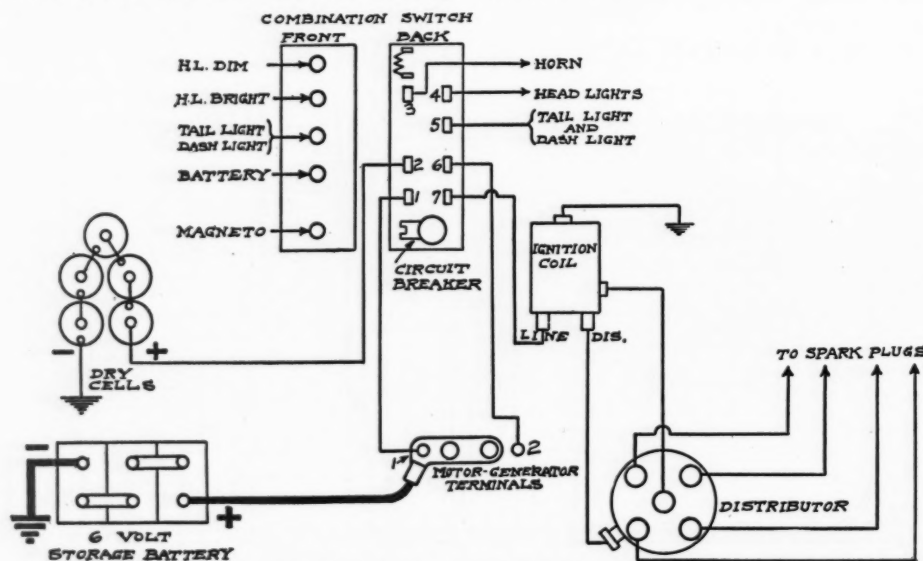


Fig. 5—Delco wiring system of 1916 Westcott

7—What are the respective gear ratios of this car in first, second and third?—Reader.

1—Most likely this is due to the spark being too far retarded when you are running at high speed. Try advancing it more at these speeds. If it were the camshaft or valves you would hear it at low speeds also.

2—The valves are of nickel steel.

3—That depends entirely upon the way the motor has been used. If poor gasoline and oil have been fed to it, it will carbonize more rapidly than if better materials have been used.

4—By the engine. You need not trouble about them so long as you keep the proper supply of oil in the motor.

5—Not to our knowledge. You might write Hudson direct on this point.

6—If you are sure the steering gear is free from play, probably the noise emanates from the spring shackle which is near the bottom of the steering gear. This noise you might mistake for a rattle coming from the gear.

7—The ratios are: High, 3.76 to 1; intermediate, 6.7 to 1; low, 11.3 to 1; reverse, 13.88 to 1.

TUNING UP A FORD FOR RACING Making the Tappets Adjustable—Using Aluminum Pistons

Middleburg, Va.—Editor Motor Age—What advantage would accrue from the use of aluminum pistons in a Ford motor at speeds up to 25 miles per hour?

2—What difference in the weight of rods would be considered negligible?

3—Would it be advisable to lap the compound type of ring in cylinders that are in good shape?

4—Which valve would probably give the best service, one of tungsten or nickel steel, in a Ford car?

5—By having a somewhat shortened valve stem, on a Ford car, could not some means of adjustment be applied to the pushrod, instead of the valve, as is the case with all adjusters I know of; that is, a specially-made pushrod with such a means of adjustment? Give me the names of manufacturers of such type of pushrods.—F. Carter Turner.

1—There would be very little difference at this speed.

2—You might have a variation of about an ounce.

3—It would probably be best to lap them in.

4—Either would be satisfactory, and both are widely used.

5—This is quite possible. The end of the rod could be threaded and an adjusting nut put on. Such a device is made by the Peerless Motor Specialty Co., New York.

Aluminum Pistons Success

Hibbing, Minn.—Editor Motor Age—Are aluminum pistons a success? What changes would I have to make other than changing pistons? How about the connecting rods, etc.—J. F. Tancig.

Aluminum pistons have been adopted by many of the leading automobile makers after long test. The aluminum pistons can be used satisfactorily with the regular rods in the engine, if that is what you mean.

Should Not Have Crankcase Compression

Council Bluffs, Ia.—Editor Motor Age—Is it possible to have too much crankcase compression and what is the cause?

If there is crankcase compression, how high does it run, and is the crankcase compression

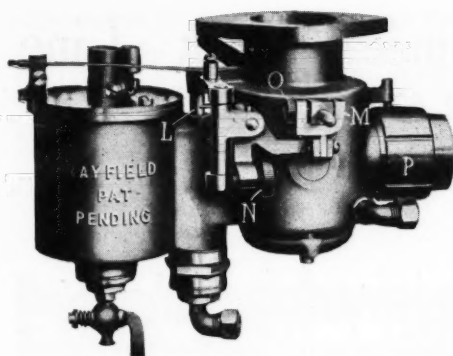


Fig. 6—Illustrating positions of adjustment on Rayfield

on a four-cylinder higher than on a six-cylinder motor?—William Moser.

In a properly designed four-cycle engine there should not be any crankcase compression. That is what the breather is for, to relieve any compression that might result from expansion of the air in the crankcase due to the heating up of the engine.

MEANING OF TRANSVERSE VALVES No Advantage in Using Two Fly-Wheels— Four-Cylinder V-Mounting

St. Louis, Mo.—Editor Motor Age—Where can I procure a centrifugal water pump such as used on the Cole?

2—How is the S. A. E. horsepower calculated?

3—How is the r. p. m. calculated?

4—How is horsepower calculated?

5—What is the meaning of transverse valves?

6—Is there any advantage of having two flywheels on engine?

7—Could a V-type four-cylinder engine be set at a 45-degree angle?—H. E. Davis.

1—Write the Cole company.

2—The formula once known as the S. A. E. now is the N. A. C. C., and horsepower is calculated thus:

$$\frac{D^2 N}{2.5} = \text{horsepower,}$$

at 1,000 feet per minute piston speed, in which D is the cylinder diameter, and N the number of cylinders.

3—The r. p. m. is not calculated. It is simply the number of times a part revolves in a minute.

4—The regular horsepower formula is $D^2 N SR$

—, in which D is the bore in inches, 15,000

S the stroke in inches, N the number of cylinders and R the crankshaft speed in r. p. m. and gives actual horsepower at a certain number of r. p. m. of any engine.

5—Transverse valves are those actuated through a rocker arm mounted on the side of the cylinder block and instead of worked in a line parallel with the line of piston travel, they operate at right angles to the pistons.

6—No. One flywheel of the proper size and weight will do all that two would.

7—No. They must be set at an angle of 90 degrees.

A Perpetual Motion Car

Mount Morris, Ill.—Editor Motor Age—Will Motor Age advise as to the feasibility of running a motor car by an electric motor which is fed with current from a dynamo under the hood, or possibly a small storage battery to assist on hills?—W. N. Dolby.

The arrangement suggested is very good except that the specifications given do not mention any method of driving the dynamo. It might be suggested that the running of the car might be used to turn the dynamo over, the dynamo driving the electric motor and the motor driving the car. This would be an ideal condition if it were possible, but it approximates too closely to perpetual motion.

METHOD OF ADJUSTING RAYFIELD Slow Speed Running First, Then Take Care of High Speed

Canton, Neb.—Editor Motor Age—What is the N. A. C. C. rating of the Maxwell 25?

2—What is the maximum speed of the engine?

3—I have just equipped my 1914 model 25 Maxwell with a B 2 model Rayfield carburetor, and I cannot get it to run satisfactory. When

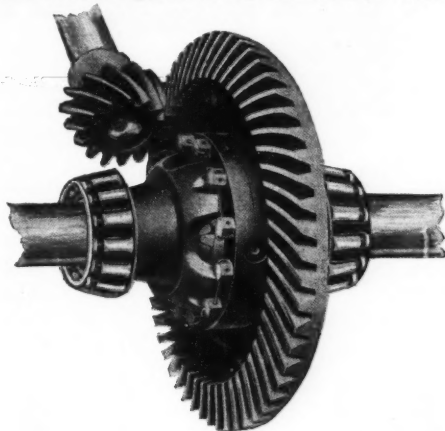


Fig. 7—A typical spiral-bevel axle gearing and differential

the low speed adjustment runs the engine satisfactory, it will miss when the motor is speeded up, and when the high speed adjustment is satisfactory the motor misses at low speed. I have a hot air pipe attached from a stove on the exhaust pipe. I cannot work the motor without priming when it is cold and the choker does not seem to help any at all.—A Reader.

1—21 horsepower.

2—2,200 r. p. m.

3—The method of adjusting this carburetor is as follows: To determine the position of the needle valve L in relation to that of the throttle, Fig. 6, the dash adjustment is placed in the neutral position, which may be determined by observing that the cam M is out of contact with the low-speed screw N. This screw is next unscrewed until needle-valve arm be-

gins to leave contact with the cam. It should then be turned to the right, one and one-half turns. The automatic air valve is then adjusted by unscrewing its exterior adjustable seat $\frac{1}{8}$ inch. The motor is then primed and started, with the throttle set about one-fourth open. Upon starting, it is throttled as slow as it will run, when the low-speed lever is turned one notch at low speed. If the throttle does not close sufficiently to permit slow speeds, the throttle stop on the reverse side of the carburetor may be unscrewed until it does. The low-speed adjustment being obtained, the motor is run until warm, when it is tested by pressing on the automatic air valve at P very gently with a pencil or like instrument. If the motor speeds up the mixture is too rich and should be thinned by turning the low-speed screw to the right until the motor begins to slow down.

The low-speed adjustment being right, the throttle is opened suddenly to see if the motor speeds up. If it is sluggish or pops back into the carburetor, the high-speed adjusting screw O is turned to the right until the fault is remedied. If after having screwed this adjustment all the way up the motor continues to pop back into the carburetor, the nozzle is too small. If at intermediate speeds the motor backfires, the adjustable air valve seat should be turned to right, decreasing the quantity of air at a given speed.

INTERESTED IN AIR PROPULSION Reader Wants to Convert a Ford Into a Wind Wagon

Peoria, Ill.—Editor Motor Age—Would a propeller-driven Ford, if stripped and properly built, be successful under ordinary conditions?

2—What size propeller should be used, and how should it be geared with reference to the speed of the engine, in order to get the most out of it?

3—Is it true that a propeller-driven car is hard to get under motion even on the level?—W. B. E.

1—We assume you mean an aero propeller drive. Such a method of propulsion has been used on light vehicles with success.

2—About 6 feet in diameter and geared to run at half engine speed.

3—This is true to some extent, although if the vehicle is of correct weight in relation to propulsive power, there should be no great difficulty on this account.

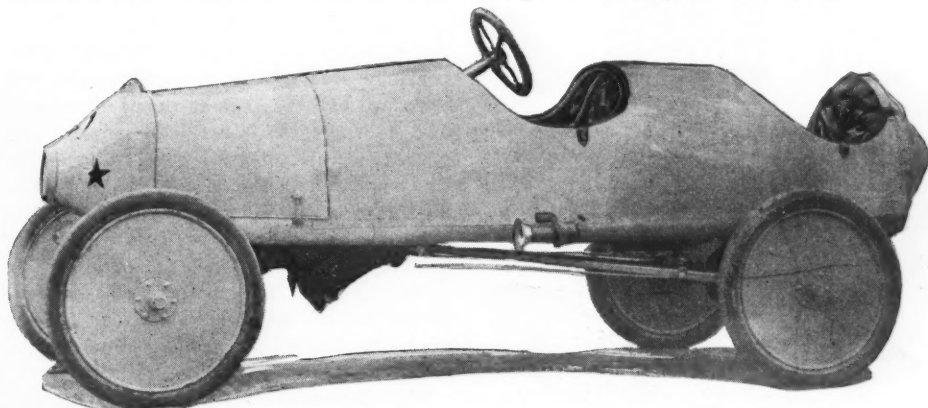


Fig. 8—How L. W. Plummer, Olney, Ill., reconstructed a Ford with the assistance of a tinner. It took 15 days work, and cost \$82.52. The weight is 1,325 pounds and it is equipped with a Simplex starter besides having a light in the middle of the front and the rear

Several Innovations Noted in Menominee Truck Line

Three Models Are Offered, Selling at \$1,125, \$1,575 and \$2,240—
Continental Engines Used

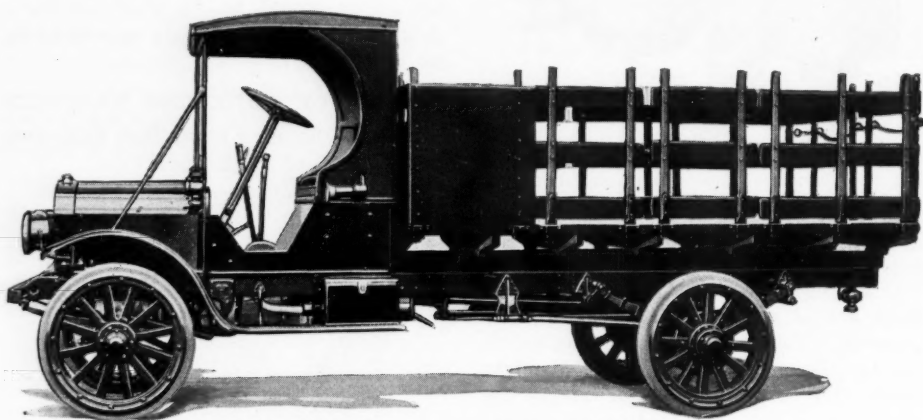
SEVERAL features not found in ordinary motor truck construction are prominent in the Menominee truck, made by the D. F. Poyer Co., Menominee, Mich. Three models, one at \$1,125, one at \$1,575 and one at \$2,240 make up this line, one of 1,500-pound capacity using the spiral-bevel drive, and the other two, of 2,000-pound and 4,000-pound capacity, employing the worm-drive. One of the features is a new type of radiator support, which also acts as a shock absorber. This is a pneumatic device, which, together with the tie rod at the top constitutes a three-point suspension and guards against road shocks, vibrations and warping stresses. This pneumatic rubber sphere offers a cushion and acts as a pivot, incased to protect it against dirt. The headlights also are carried on this shock-absorbing bracket.

Auxiliary Springs Are Coiled

Menominee trucks have auxiliary springs, coiled and fitted with special brackets and plunger guides. These springs come to the assistance at a time when the main springs are about to be overtaxed. In addition to this function, the auxiliary springs displace the ordinary rubber bumper and do not allow the load to come in dead contact with the rear axle.

There is an automatic governor which regulates the speed of these trucks. This governor controls the velocity of the propeller shaft rather than that of the motor. The device is driven by means of a friction wheel coming in contact with the universal flange, acting on the intake manifold through push rods. Construction is so simple that it is said there is nothing in the governing device to get out of order.

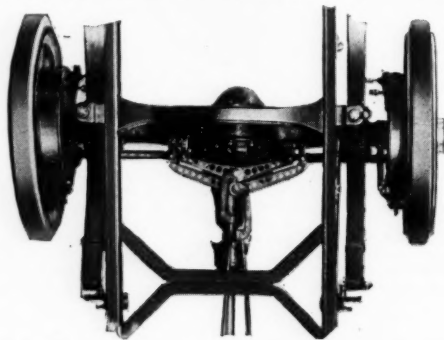
The brake eveners are of the universal acting type, designed to eliminate the possibilities of rods or yokes binding and in-



Menominee worm-driven truck fitted with stake body

suring good braking service at all times.

All three models use Continental motors, Stromberg carburetors, Bosch magnetos and employ the combination splash and force-feed system of lubrication. The Model E has a four-cylinder, $3\frac{3}{4}$ by 5-inch powerplant, the Model FW, 1-ton, a four-



Brake eveners used in the Menominee trucks

cylinder, $3\frac{3}{4}$ by $5\frac{1}{4}$ -inch, and the Model D, 2-ton, a four-cylinder, $4\frac{1}{8}$ by $5\frac{1}{4}$ -inch. In all models the motor is under the hood. The smallest type uses thermo-syphon cooling and the other two, gear-driven, centrifugal pump.

The clutch is a Brown-Lipe, multiple-disk, in all three models. The transmission also is Brown-Lipe with three speeds forward and one reverse. Timken roller bearings are used on the main shaft and Standard ball bearings on the countershaft. The steering gear is a Gemmer, worm and gear type, and the drive is on the left. The rear axle on the Model E is a Timken floating with nickle steel axle shafts, the spindles being fitted with Bower roller bearings.

On the other two models, the Timken-David Brown worm type of rear axle is used, the shafts being mounted on Timken roller bearings.

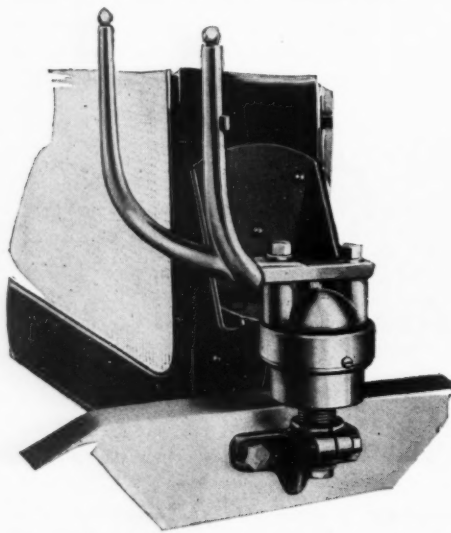
The Menominee truck line has another feature not mentioned in the earlier part of this description, it being a tubular type of distance rods designed to relieve the

springs of driving stresses. These distance rods are set at an angle so as to maintain uniform distance between the gearset and the rear axle regardless of spring action. This is said practically to eliminate all sliding action of the propeller shafts in the universal. These rods act on swivel attachments on a frame bracket and are provided with adjustments, making it possible to maintain the axle in alignment at all times.

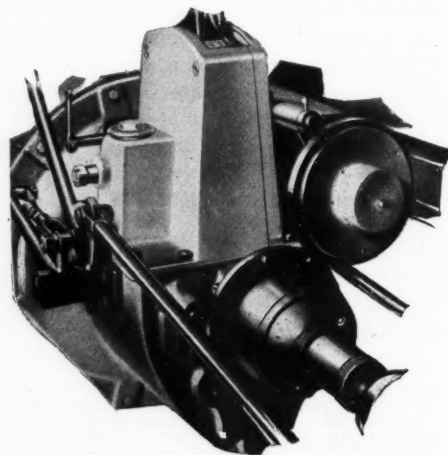
Gear Ratios

The gear ratio of the model E is $5\frac{1}{13}$ to 1, the model FW, $8\frac{3}{4}$ to 1, and the 2-ton, $9\frac{1}{4}$ to 1. Semi-elliptic springs, both front and rear, are found on all models in addition to the auxiliary springs already mentioned. The service brakes are external-contracting, and the emergency, internal-expanding. When the emergency is applied the service brake automatically comes in service. The break eveners mentioned in a preceding paragraph are found on the two heavier types of Menominee trucks.

The maximum speed of the model E is given as 25 miles per hour, of the model FW 16 miles per hour, and of the model D, 14 miles per hour, all of these being



Pneumatic radiator support, shock absorber and lamp bracket



Friction-drive governor, which acts through push rods to manifold

controlled by the automatic governor. The wheelbases for the model E, FW, and D are 124, 144, and 144 inches, respectively. Tires are solid rubber, demountable or pressed on, 34 by 3½ single, front and rear, on the model E, 36 by 3½ front and 36 by 5 rear, single, on the model FW, and 36 by 4, single, front and 36 by 6, single, or 36 by 4, dual, rear on model D.

The chassis equipment includes, driver's seat, running boards, headlights, prest-O-Lite tank, two dash lights, tools, and two front and two rear fenders.

Special bodies are furnished at various prices for the different types of trucks. The trucks will be painted any color desired without extra charge when ordered with bodies, although the standard colors are yellow running gear and red body.

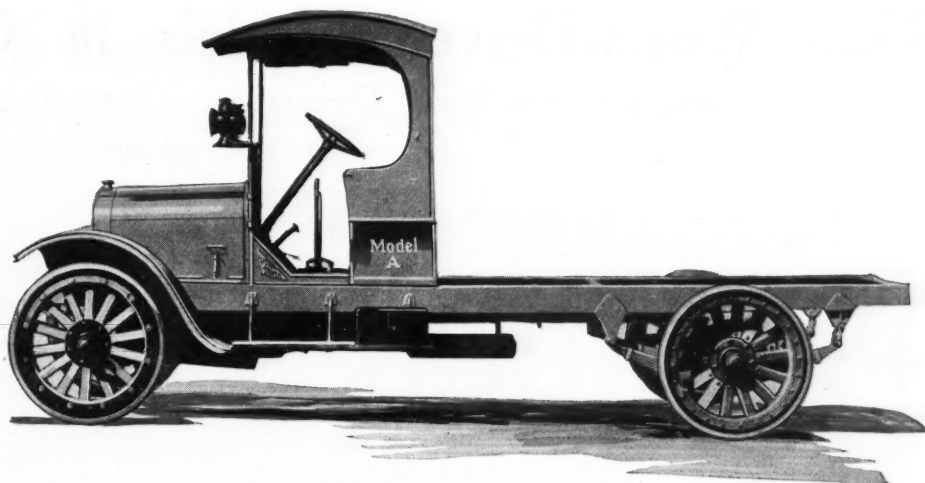
CHASE HAS NEW WORM-DRIVE

The Chase Motor Truck Co., Syracuse, N. Y., has a new 1-ton worm-driven truck, known as the model A, and listing at \$1,650, which employs a four-cylinder, L-head motor with a 3½ inch bore and a 5½ inch stroke.

The carburetor is a Holley, and the ignition is by Bosch magneto. The gearset is a Brown-Lipe, offering three speeds forward and one reverse, the gearset case being attached to the flywheel housing. The clutch is a dry-plate and the drive is through a worm of the David Brown type in connection with a Sheldon rear axle.

The steering gear is of the worm and nut type and the wheelbase is 140 inches. Front tires are 36 by 3½-inch, single, solid Firestones, and the rear 36 by 5 single, solid. Springs are semi-elliptic, front and rear. The tread is 56 inches, and the weight on the rear axle is said to be 53 per cent. The fuel tank holds 18 gallons, and the oil tank 1¾ gallons. The loading space back of the driver's seat is 8½ feet.

Speed is regulated by an automatic gov-



Chase, model A, 1-ton worm-driven truck

ernor, entirely inclosed and sealed. Electric lighting and starting equipment, and rear fenders, are furnished but are not included in the price of \$1,650. Where the cab and seats are not wanted, a reduction of \$40 is made from the list price.

TRUCK CHASSIS FOR FORDS

A chassis designed to be applied to Ford cars for converting them into commercial trucks is being made by the Iowa Motor Truck Co., Ottumwa, Ia. These chassis are made in two sizes, one designed to carry a weight of 2,000 pounds, and one 3,000 pounds. The axle in the lighter model is of the internal drive gear type, mounted on roller bearings, and having a gear ratio of 9 to 1.

Drive is taken through a tubular shaft with a universal on each end. Single brakes are used being of the external contracting type. Springs are 2½ inches by 2 inches with 10 leaves. The shackle bolts for the springs are ¾ inch, equipped with oil, way and grease cups. Tires are 32 by 3½ Motz, and the wheelbase is 124 inches. The price of this model is \$360.

In the heavier model the preceding specifications are the same, except for the springs being 3 inches wide instead of 2½ inches, and the tires being 32 by 4 instead of 32 by 3½. The price is \$425.

TEST KINGS IN ROCKIES

Denver, Colo., Jan. 22—A lively stimulus for winter driving and winter buying has been provided in considerable Colorado territory the last 2 weeks by J. C. Kimsey, president of the Mid-West Auto Sales Co., Denver, and half a dozen factory representatives, who have conducted an extensive testing of the King in severe climbing trips in the mountains in

the Denver, Colorado Springs and Cripple Creek districts. The factory men were delighted not only with the results of the tests along all lines, but also with the snow-adorned scenery, the excellent roads and other enjoyable features of winter motoring in the Rockies.

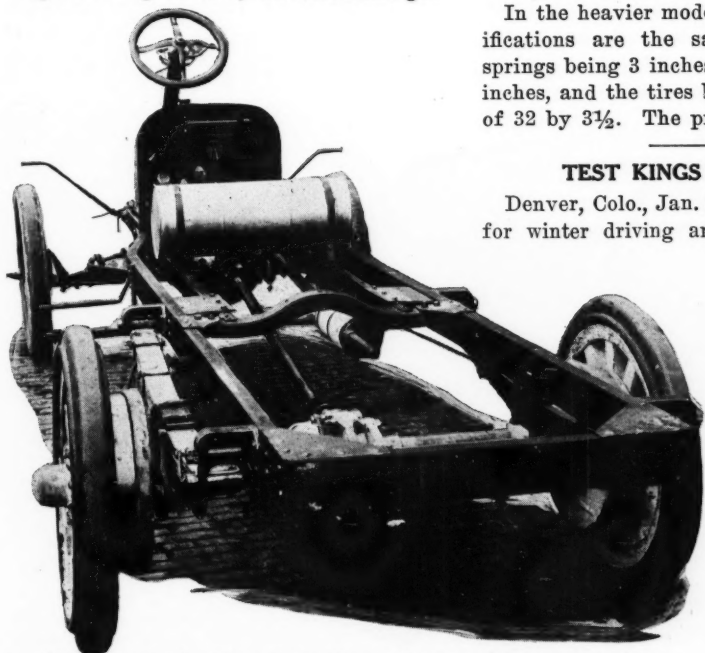
FORM LION TIRE COMPANY

La Fayette, Ind., Jan. 22—The Lion Tire and Rubber Corp., this city, has been incorporated with a capital of \$150,000 to manufacture tires. The company has purchased the Heinz plant on Union street, where it will carry on its manufacturing. The incorporators are Ferdinand Dryfus, Thomas Follen, P. F. Freel, W. A. Klepper, R. K. Bedgood, H. J. Haarmeyer, of this city; G. B. Smity, of Pittsburgh; J. T. Cullen, of Peru; Thomas Crane, of Chicago; and Edward Taylor, of Montmorenci. The following officers have been elected. President, Ferdinand Dryfus; first vice-president, Thomas Follen; second vice-president, Edward Taylor; treasurer, P. F. Freel, secretary, H. J. Haarmeyer.

WILL MAKE CHEAP GASOLINE

Milwaukee, Wis., Jan. 22—According to John C. Zeman, one of the owners of the Standard-Racine Rubber Co., the United States Electric Tool Co., the Jefferson Oil Co., and other Milwaukee corporations, relief is in sight for the gasoline buyer. Mr. Zeman is authority for the statement that a new process of manufacturing gasoline will be introduced in April or May by a new company, the American Oil Products Co., which will erect a \$50,000 plant and warehouse in Milwaukee. Mr. Zeman believes the price of the ordinary grade of gasoline used by motorists will be reduced to 15 cents by the new process, compared with 20 to 22 cents per gallon at present. No further details of the process or plans of its inventor are divulged.

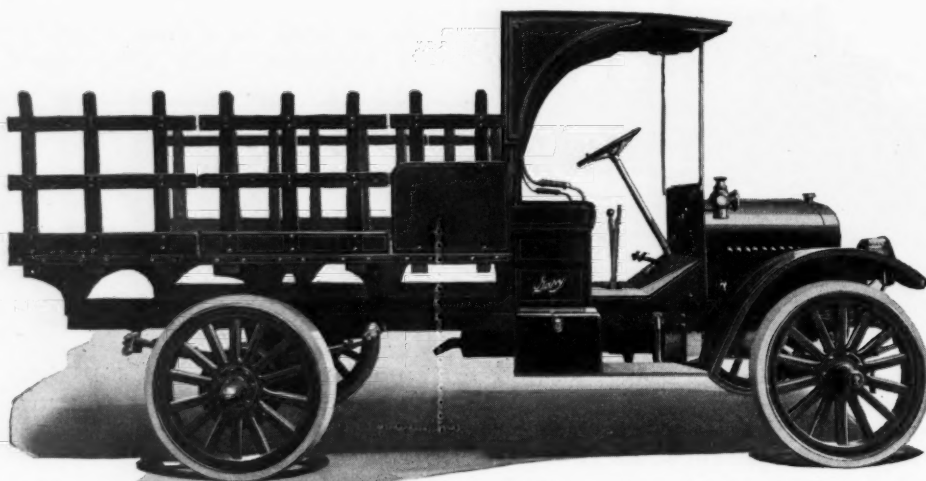
Another increase of 1 cent in the price of gasoline was recorded by both Standard and independent companies in Milwaukee December 30, making a total advance of approximately 9 cents during the year 1915.



Chassis made by Iowa Motor Truck Co. for attachment to Ford

Four Worm-Driven Models in Gary Truck Line

Buda Engines Used Throughout—New Type S. V. Goodrich
Tires a Feature



One model of the Gary worm-driven trucks

THE Gary Motor Truck Co., Gary, Ind., has in its worm-driven truck line, four models, the model E, being of 1,500 pounds capacity, the model F, 1 ton; the model G, 1½ ton; and the model H, 2 tons. All models use four-cylinder Buda motors, the smaller model having a bore of 3½ inches and a stroke of 5½ inches, the next, 3¾ by 5¾; the 1½-ton, 3¾ by 5¾; and the 2-ton, 4¼ by 5½. The crankcase is aluminum and the valves are inclosed.

The ignition on all models is by Eise-mann magneto, while the carbureter is Stromberg, float feed. Lubrication is accomplished by the constant-level splash system, together with a pump. The gear-set is of the selective type, offering three speeds forward and one reverse. The clutch is a multiple disk, having facing of Raybestos and running dry. It is operated with a ball throw-out bearing. The steel disks are hardened saw-steel and all pins are hardened, this construction being designed to eliminate wear as much as possible.

High Power Efficiency

The rear axle incorporates the worm; the power efficiency at the rear wheels is said to be from 94 to 97 per cent of the load applied. This efficiency, it is said, may be depended upon for an average of 80,000 miles. The company advocates the use of the semi-floating type of worm-drive rear axle as against the full-floating for the reason that there are but fourteen parts to the former, whereas, the latter has twenty, and thus it is argued that the former is more simple.

Goodyear, new type, S. V., solid tires are used on all models of the Gary, the ¼-ton using 36 by 3 in front and 36 by 3½, rear; the 1-ton, 36 by 3½ in front and 36 by 4, rear; the 1½-ton, 36 by 3½, front and 36 by 5, rear; the 2-ton, 36 by 4 in front and 36 by 6 in the rear.

Springs are semi-elliptic, both front and rear, and the steering gear is of the worm

and split-nut type, equipped with an 18-inch wheel on all models. Equipment consists of side oil lamps, tail lamp, horn, jack and tools. Regular express or stake bodies are furnished, although special styles to meet individual requirements are built to order.

These trucks are guaranteed for 1 year, from the date of delivery to the purchaser, this guarantee being limited to making good, at the factory, any part or parts, that are defective. The company stipulates, however, that the guarantee ceases on any truck on which the governor seals have been broken.

Elliott Leaves United Truck

Chicago, Jan. 25—E. M. Elliott has resigned as vice-president and general manager of United Motor Truck Co., Grand Rapids, Mich. His future plans are not announced.

New Dump Body for Jeffery Quads

Method of Operation Is Said to Be Very Simple

THE Thos. B. Jeffery Co., Kenosha, Wis., has brought out a new two-way, side-dump, body, hand-operated, to be applied to the Jeffery Quads. The body is secured in position by two catches, one in front and one in the rear, and an eccentric stop on each side; as well as by three rails on which it rolls in dumping. Each of these rails slopes away from the center line of the chassis to each side and terminates in a hook which acts as one of the pivoting points when body is dumped.

In performing the dumping operation the handle, which will be noted in the brace just over the right rear wheel in the illustration, is raised, thus releasing

the eccentric stop at the upper end of this brace. When the handle is raised clear up this brace may be moved outward which leaves the body free to turn. Next the handle noted in the rear of the body is moved, the action releasing a catch at the top of the inverted V-brace, just above the handle, and a similar catch in front, connected by a longitudinal rod.

The body now is ready to be dumped, which is done by pulling out one of the handles that will be noted on the rear end of the dump body at the top. The distance which the body rolls is governed by chains, one end fastened to the body and one to the truck bed.



Dump body on Jeffery Quad, showing operation

Nilson Farm Tractor Is Equipped with a Waukesha Engine

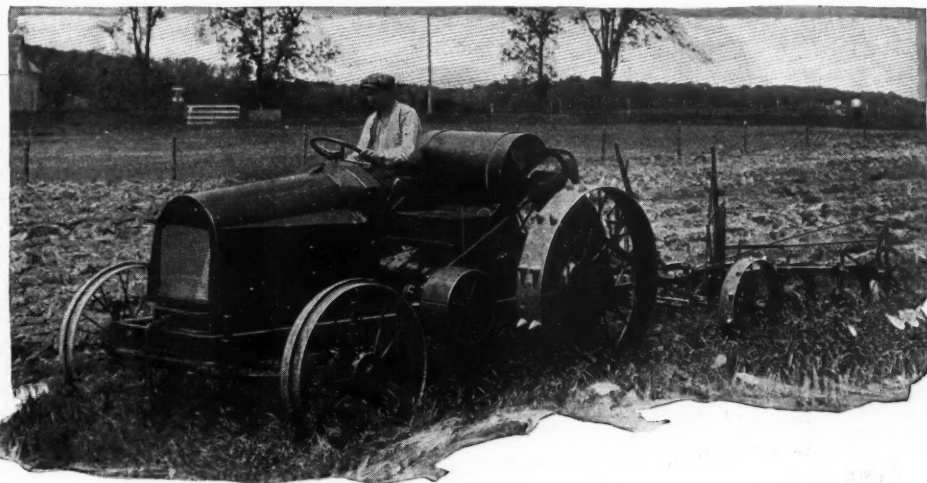
Power Plant Has Four Cylinders, with a Bore of $4\frac{3}{4}$ Inches and a Stroke of $6\frac{3}{4}$ Inches

IN the Nilson farm machine, made by the Nilson Farm Machine Co., Minneapolis, Minn., and listing at \$1,485, f. o. b. the factory at Waukesha, Wis., one finds a tractor of unusual power, linked with light weight and flexibility. Control is simple, being like that of a motor car or truck. It is sold under a guarantee, covering the motor for one year, during which any part or parts of the engine that under normal use of service wear out or show defects will be replaced free of charge. The tractor is guaranteed if maintained in proper order and operated by a thoroughly competent person to pull four 14-inch braking plows, 5 to 7 inches deep in sod or 7 to 9 inches deep in stubble soil; to haul a load of 7 to 8 tons on good roads; to operate a 30-inch separator and equipment, and other stationary equipment for farm work of a similar nature requiring equivalent power, such as seeders, drills, harrows, harvesters and ensilage cutters.

Uses Waukesha Motor

A Waukesha motor is used, having a bore and stroke of $4\frac{3}{4}$ by $6\frac{3}{4}$ inches. It is cooled by centrifugal pump, and Perfex radiator, together with a fan. The speed of the engine is regulated by a governor which is adjustable, self-lubricating and non-heating. The engine is rated at 50 to 55 horsepower and has a drawbar pull of 25 horsepower, while the belt power pull at 800 r.p.m. is 35. The engine is fitted with a Kingston carbureter, although a special combination kerosene and gasoline carbureter is furnished at an extra price. Ignition is by magneto, together with a K-W impulse starter.

The gearset runs in oil, being encased in a heavy, cast-iron, oil and dustproof housing. Two speeds forward and one reverse are offered. The speed in low is approximately $2\frac{1}{2}$ miles per hour at 800



The Nilson farm machine designed for heavy farming utility

r.p.m. of the motor, while the same motor speed gives 6 miles per hour in high, although both the high and low speeds can be raised or lowered at the option of the driver. Adjustments are possible in the clutch transmission bearings and driving chains to take up wear.

The engine and gearset are each mounted separately on the frame by three-point suspension. The engine and gearset are connected by a universal. Power is delivered to the bull wheel through double chains. The front springs are semi-elliptic and the rear springs are coiled with a special adjustment and equalizing feature. The steering gear is of the worm and sector type and works in an oil-proof case. The weight is approximately 5,200 pounds exclusive of extension wheels.

These extension wheels just mentioned are 52 inches in diameter and 9 inches wide, and when not ordered included with the tractor, a reduction in price of \$47.50 for the wheels and \$7.50 for one shaft pulley is offered.

The length over all is 13 feet 9 inches. The tread of the front wheels 6 feet 8 inches, and the extreme

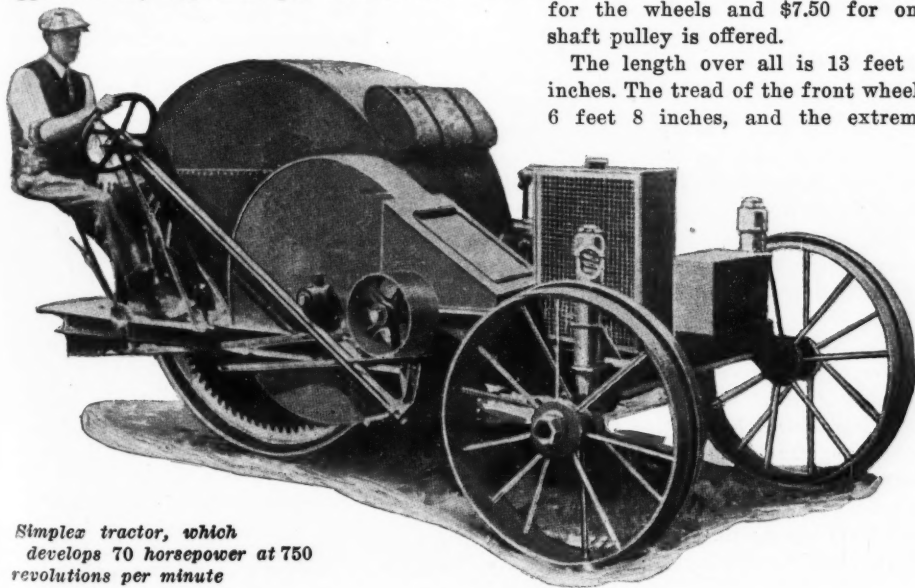
width, 7 feet 5 inches. The height is 5 feet 9 inches, the wheelbase 8 feet 4 inches, and the turning circle, or radius, 34 feet. The front wheels are 36 inches in diameter, and the traction, or driving wheel, 52 inches in diameter, with a 23-inch face.

DOUBLE OPPOSED MOTOR IN SIMPLEX

Designed to do the work of twelve horses, the Simplex tractor, made by the Simplex Tractor Co., Minneapolis, Minn., is equipped with a four-cylinder double-opposed motor having cylinders with a bore of 5 inches and a stroke of 5 inches. This motor is designed especially for tractor work developing 70 horsepower at 750 r.p.m. In this four-cylinder double opposed motor, the explosion strokes of two-cylinders are couched by half of the crankshaft bearings at one side, and the explosions of the opposing two cylinders by the opposite side of the bearings.

The Master gear is of the internal type and is made in sections so that replacements are made easy if some of the teeth should become damaged. This gear attaches to and drives on the wheel rim. Self-lubricating steel pins are found in the master pinion, roller sleeves substituting for the regulation teeth so that when the gears roll out of mesh friction is materially reduced. A Kingston self-adjusting carbureter is used and also a Kingston magneto with impulse starter. Guiding is automatic and plowing the right front wheel carrying a guiding rim which runs in the furrow and operates as a leader or guide. Oiling is by pump.

The wheelbase is 7 feet 6 inches, and the length overall 12 feet. The tread is 6 inches center to center, and the turning radius, 17 feet. The weight is 5,500 pounds, and the price completely equipped for traction or belt work \$825. The belt pulley measures $9\frac{1}{4}$ by 14 inches.



Simplex tractor, which develops 70 horsepower at 750 revolutions per minute



The Motor Car Repair Shop



How the Bevel Gear Differential Operates

SO many inquiries have been received as to the action of the differential in the average car that it seems pertinent to give a general description of this important part of motor car construction at this time. Figs. 1 and 2 show the parts of the ordinary differential.

The spider has mounted upon it four pinions, although sometimes two or three pinions are used. The spider with the pinions fits into the large bevel gear B as shown at A in Fig. 2. On either side of the four pinions are two bevels, the axle shafts fitting into the squared ends of these bevels.

When the wheels are on the ground, and the weight of the car on the wheels the spider remains still. The pinions also are still and the entire differential revolves, but the only gear that really moves is the large driven bevel, that is, the pinions move but do not revolve upon their individual axes.

One wheel may go backward and the other forward. In this case the pinions revolve upon their axes. The bevels into which the axle shafts fit may go in opposite directions. This is best illustrated by putting a spool between the palms of the hands and rubbing them together. One

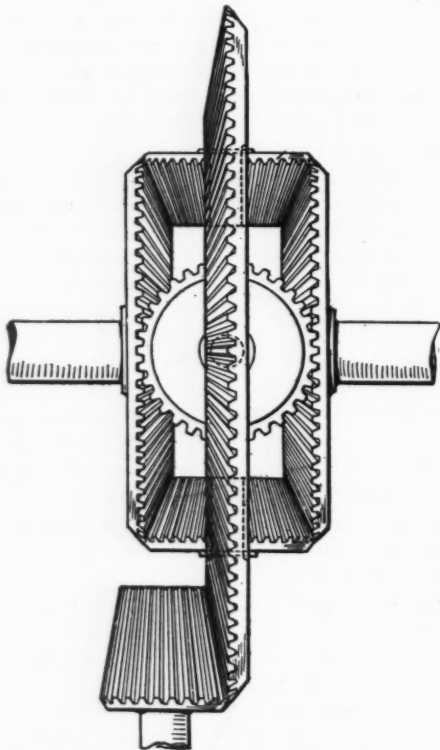


Fig. 1—Assembly of the bevel gear differential, showing the relation between the component parts. The pinion gears are idle except when the wheels are not turning at the same speed

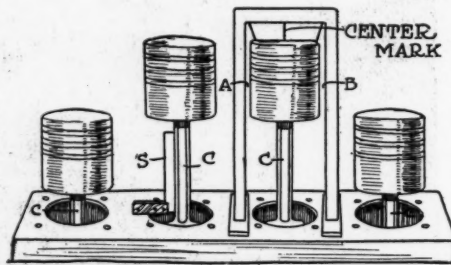


Fig. 3—One method of lining up pistons and connecting rods of block motor. S represents a square placed alongside the connecting rod C to determine whether it is true or not. If the rod is true and the piston square the distances A and B should be the same

hand goes one way, and the other, the other, while the spool which is between them revolves. The motor car's rear wheels may do the same thing, or one remains still while the other revolves due to the differential action.

Lining Up Pistons

A good many motorists find difficulty in squaring and lining up pistons and connecting rods in the cylinders. Fig. 3 shows the methods by which this usually is done. Piston squaring and connecting rod lining are important factors in motor assembly. Each factory may employ a different method of doing these things, but the difference usually is in the construction of the liners. In the suggested lining-up apparatus, shown in Fig. 6, a square S is used to determine whether the connecting rod is straight. The connecting rods usually are drop-forged, and drop-forgings easily are bent. If the side of the square does not touch the connecting rod C at every corner, then the rod should be bent so that it will be parallel with the side of the square. This is done with each rod.

Piston squaring is accomplished usually by the use of the jig shown in Fig. 3. It is a three-sided tool with a base plate B perfectly flat. The flange M is triangular in shape and the sharp edge is made to touch the piston P. The squaring method is as follows:

The motor is cranked until the two pistons are up as far as possible. The jig then is slipped over one of the pistons as shown in the illustration. The center mark of the flange should be lined up with the center of the connecting rod as shown by the dotted line. When this has been done the piston is in the position it occupies in operation. The distances A and B should be equal. If they are not then the connecting rod should be bent until they are, and the rod lined up again. The operation continues until the rod is straight and the dis-

tances A and B are equal. The bottom of the flange must be flush against the top of the piston. If any space appears between the two, then the piston is not square. The connecting rod then is bent until the piston is straight. The rod is bent back and forth very easily with a tool designed for the purpose.

The difficulty of the job is in getting a position that will make A and B equal and at the same time keep the rod straight and the piston flush against the bottom of the flange.

Taking Down a Motor

To the uninitiated motorist it is sometimes a problem as to just how to go about taking down the motor. He sees everything in its place and is somewhat in the same frame of mind as the small boy who, having completely dismantled his father's watch, is in a panicky state on realizing that he cannot get it back together as it should be. To make sure that you will get the wiring back the way it belongs, either tag each wire as you take it off, or follow some similar procedure. Mark each kind of bolt or nut, the location of which you might forget, with a tag that will tell you just where it goes.

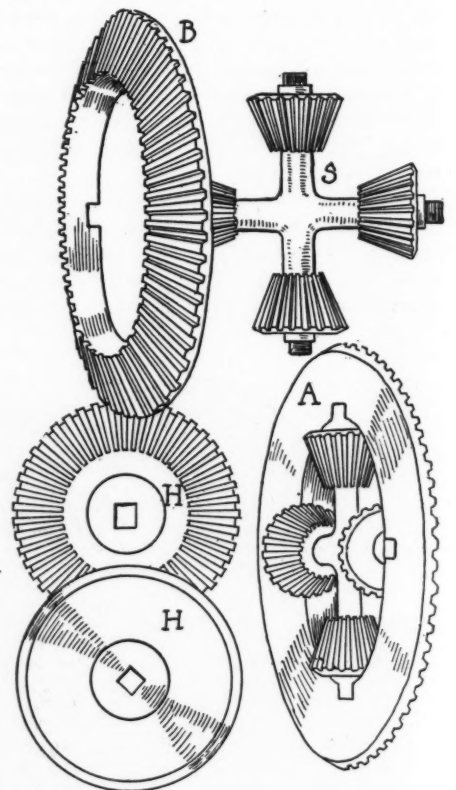


Fig. 2—Separated parts of the ordinary differential gear. A is the spider, B the large bevel gear, F the four pinions, H the two driven bevel gears meshing with the four pinions

From the Four Winds

WHITMAN'S Car Is No. 1—License plates for the year beginning on February 1 have been assigned by the license bureau of New York. Governor Whitman has Nos. 1 and 2 in the metropolitan district.

Motor Is Harness Shop Foe—The oldest harness shop in central Kansas has closed its door. The motor car is to blame, at least Fred Krauss, proprietor of the store under that name at Topeka, said the motor car had cut into his sales until it had become unprofitable to conduct the shop.

\$5 a Pull Farmers' Charge—Farmers in the vicinity of Chapin, Ill., have increased the charge for hauling cars out of mud holes from \$3 to \$5, following a lawsuit in which John McDaniel sued S. T. Erixson for \$3 when the latter refused to pay that sum following rescue work. A jury gave the complainant but \$1. The agriculturists denounced the finding, arguing that \$5 is little enough to charge.

Municipal Garages for Politicians—With the rapid adoption by cities of Illinois and other western states of motor cars for transportation of public officials and of motor vehicles for the police and fire departments, it has become necessary to change public buildings to conform. Many cities are tearing down the barns which were occupied by the horse-drawn vehicles and horses, where they can not be utilized to advantage for housing the motor vehicles.

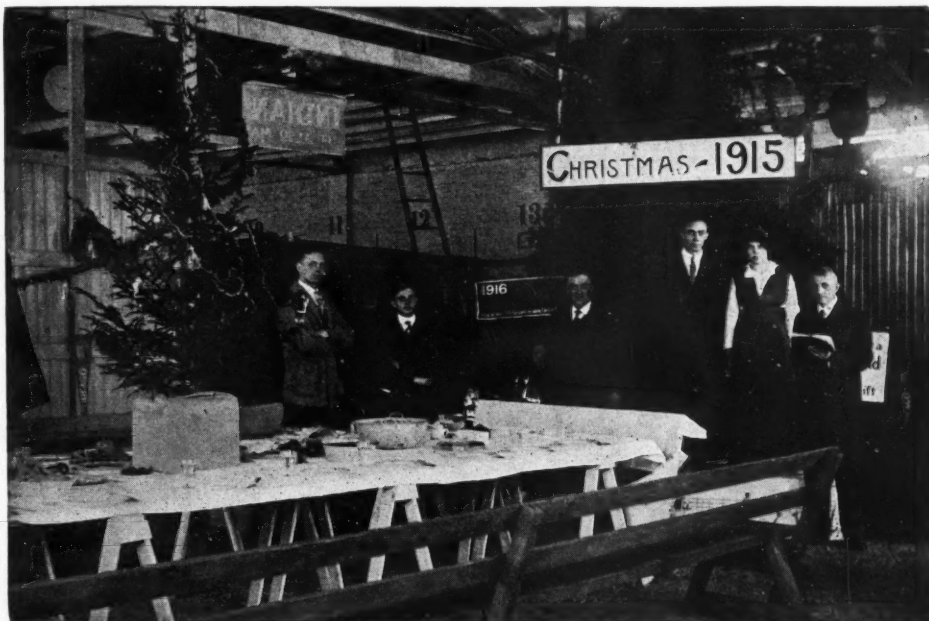
Aurora is one of the first Illinois cities to erect a garage for municipal vehicles, while others are remodelling the buildings use as barns in the past.

Good Roads Activities

Corduroy Roads in Arizona—Corduroy roads are to be given a thorough tryout in Arizona. The Pinal county board of supervisors has arranged to have a corduroy road laid across the sandy Santa Cruz wash, near Casa Grande. Poles 6 inches in diameter will be used, and anchored to prevent their being washed away by floods. The Santa Cruz wash is a wide, sandy bottom and the county has spent a great deal of money keeping the road across it passable.

Meridian Highway Promoters Meet—A meeting of the Meridian Highway Association promoters, held at Bloomington, Ill., was attended by representatives from all of the important cities between Rockford and Cairo. A committee was appointed to tour the proposed highway as soon as the weather will permit and make a permanent selection of the route and also take steps to improve it. A portion is already marked by permanent stretches and oil distribution. An organization will be perfected in each township to take care of that portion of the road contiguous and also to erect the markers.

Wisconsin Road School—The fifth annual Wisconsin Road School, held by the Wisconsin state highway commission to instruct county highway commissioners, road-builders and others interested in highway improvement, will be held at the state capitol in Madison, Wis., from January 31 to February 5. Each year nearly 500 attend the school, which is open to any citizen of Wisconsin, whether connected officially with state aid road work or not. A large exposition of road machinery and tools, materials, etc., is held in conjunction with the convention.



PERHAPS you remember when the street carnival came to your town and the ballyhoo with the wild animal show announced that \$50 in gold would be given the young couple that would be married in the cage of Wallace, the Untamable; Wallace, the man-eating lion. Well, the traveling showmen have been outdone. On Christmas day, L. F. Bunk, a motor car mechanic, and Miss Evangeline Wood, residents of Rensselaer, Ind., were married in the garage where the former is employed, amid the dollar-devouring taxicabs and the gasoline-gourmandizing limousines. The couple made all the customary promises in the shadow of a Maxwell car, which stood with front door ajar ready to take the newlyweds on their honeymoon.

Coming Motor Events

SHOWS

January 29-Feb. 5—Columbus, O., show.
January 29-Feb. 5—Minneapolis, Minn., show.
February 1-5—York, Pa., show.
February 7-12—Kansas City, Mo., show.
February 9-12—Peoria, Ill., show.
February 12-19—Hartford, Conn., show.
February 14-19—Des Moines, Ia., show.
February 20-27—Grand Rapids, Mich., show.
February 21-26—Louisville, Ky., show.
February 21-26—Omaha, Neb., show.
February 21-26—Syracuse, N. Y., show.
February 28-March 4—Utica, N. Y., show.
February 29-March 4—Sioux City, Ia., show.
February 29-March 4—Fort Dodge, Ia., show.
March 4-11—Boston show.
March 8-11—Davenport-Rock Island-Moline show.
March 8-11—Mason City, Ia., show.
March 9-11—Kenosha, Wis., show.
March 21-25—Deadwood, S. D., show.
April 10-17—Seattle, Wash., show.

CONTESTS

May 13—New York City, Sheepshead Bay speedway race.
May 30—Indianapolis speedway race.
June 10—Chicago speedway race.
June 28—Des Moines, Ia., speedway race.
July 4—Minneapolis speedway race.
July 4—Sioux City speedway race.
July 15—Omaha, Neb., speedway race.
August 5—Tacoma speedway race.
August 18-19—Elgin road race.
September 15—Indianapolis speedway race.
September 30—New York City, Sheepshead Bay speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.

With the Motor Clubs

Club Protests Gasoline Tax—The Automobile Club of St. Paul, Minn., has passed a resolution protesting the proposed revenue tax on gasoline. Motorists in the Twin Cities look upon the proposed move with disfavor and promise combined support to defeat the measure.

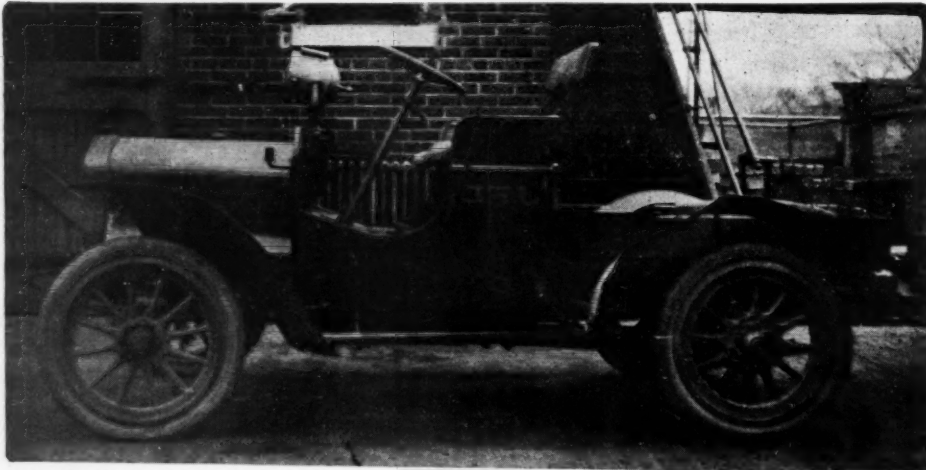
Oberlin Has Club—The Oberlin Automobile Club, Oberlin, O., has been organized with an initial membership of fifty-eight. The organization has affiliated with the Ohio Automobile Association. Officers elected are: Frank J. Dick, president; Willis A. Hart, vice-president; Irving L. Marsh, secretary and W. D. Hobbs, treasurer.

Hartford Club Elects—At the annual meeting of the Automobile Club of Hartford, Conn., John A. Wilson, president of the American Automobile Association, spoke with reference to preparedness. He also discussed general registration. During the business session the following officers were re-elected: President, Clarence H. Wickham; vice-president, F. Spencer Goodwin; secretary, Arthur Fifoot; treasurer, E. R. Woodhouse.

Club Formed to Promote Roads—The Hancock County Automobile Club has been organized at Findlay, O., with Judge William F. Duncan, president; George F. Byal, vice-president; Frank M. Barnhart, secretary, and Frank J. Collingwood treasurer. There are more than 2,000 car owners in the county, and an attempt will be made to get them all as members. The membership fee and annual dues is only \$1 per year. The money so secured will be used for construction of road in the county. The first thing done will be to erect signs at every cross road in the county.



Among the Makers and Dealers



TWO-CYLINDER RELIC FIGHTS FIRE—A Buick two-cylinder, owned by the city of Joplin, Mo., was purchased in 1907. On June 8, 1907, it made what is said to be the first run to a fire that was ever made in a gasoline-driven motor car. It has continued in the service ever since, and today forms a part of an efficient and finely equipped fire department that uses motor cars exclusively. It is affectionately named "The Goat" by the boys.

BROWNWALL Gas Engine Adds—The Brownwall Gas Engine Co., Holland, Mich., will triple the capacity of its plant this year. Plans have been made for a new building 50 by 100 feet and the capital stock lately has been increased to \$50,000.

Reliance Adds to Force—At the different plants which constitute the Reliance Engineering Co., Lansing, Mich., a large force of men is being added as rapidly as possible to secure the class of workers needed. Orders now on hand will keep the works busy all year round, it is said.

Ajax Declares Dividend—The directors of the Ajax Rubber Co., have declared a quarterly dividend of \$1.25 a share, placing the stock on a 10 per cent basis, or \$5 per share annually. The company was formed a few weeks ago to acquire the assets, business and good will of the Ajax-Grieb Rubber Co. The company acquired had been in business more than 10 years. Net earnings

for the last 4 fiscal years ending August 31, 1915, averaged \$432,445.84 annually, this being equivalent to over 14 per cent of the par value of the \$3,000,000 stock of the Ajax Rubber Co.

Michigan Body-Maker Adds—The Motor Truck Body Co., Detroit, Mich., is putting up a new plant one story high, 245 by 64 feet. This company makes a specialty of truck bodies.

Poyer Leaves Menominee Truck—D. F. Poyer has severed his connections and withdrawn his interests from the D. F. Poyer Co., Menominee, Mich., manufacturer of the Menominee motor truck, which is described elsewhere in this issue.

Signal Truck Increases Capital—The Signal Motor Truck Co., Detroit, Mich., will increase its capital stock from \$85,000 to \$450,000, \$300,000 to be common and \$150,000 7 per cent accumulative preferred. All of the common stock will be put into a voting trust for a period of 5 years. The truck

company will enlarge its plant and intends greatly increase its production. Its sales during 1915 were over 500 per cent better than in 1914. The company, which is now incorporated under the laws of Michigan, will be reincorporated under the laws of the state of Maine.

Jackson with Chicago Westinghouse Co.—A. E. Jackson has been appointed western representative of the motor equipment department of the Westinghouse Electric & Mfg. Co., Chicago.

Helling with Miller-Lillich—J. F. Helling is sales manager for the Miller-Lillich Mfg. Co., of Fort Wayne, Ind., a new company just incorporated for \$100,000 to make a non-skid device and a radiator everful system.

Champion Adds at Toledo—The Champion Spark Plug Co., Toledo, O., broke ground last week on its new factory addition. Fifty-five thousand square feet of floor space will be added, which will double the size of the present plant.

Studebaker Manages the Firestone—C. D. Studebaker, who has been connected with the New York branch of the Firestone Tire & Rubber Co., has been appointed branch manager to take the place of D. C. Swander, who has been eastern district sales manager.

Big Plant for Gier Specialties—The new plant of the Gier Pressed Steel Co., Lansing, Mich., where its new one-piece metal bodies will be made, will be one of the largest in the country. The building will be 600 feet long and 160 feet wide. The output of other lines, light sheet metal stampings, etc., also will be greatly increased.

Grant Motor Selects Officers—The Grant Motor Co., Findlay, O., has elected officers, as follows: Directors, A. E. Dorsey, David A. Shaw, E. C. Edwards, George S. Wait, George Sayzman and James M. Howe, Findlay; R. R. Hall, New York, and George Grant, Detroit. The directors have elected the old officers as follows: President and treasurer, D. A. Shaw; first vice-president, George Grant; second vice-president, George Salzman; secretary, George S. Waite. Officials of the company deny that anyone is attempting to reorganize it into a \$1,000,000 concern.

Atlantic City, N. J.—Virginia Avenue Garage; capital stock, \$25,000; incorporators, C. D. Burk, F. C. Burk, E. H. Burk.

Akron, O.—Rubber City Auto Co.; capital stock, \$2,000; incorporator, Joseph Ivory.

Atlantic City, N. J.—Bungalow Park Garage; capital stock, \$25,000.

Columbus, O.—Tubless Tire & Rubber Co.; capital stock, \$75,000; incorporator, O. J. Hicks.

Chicago—Chicago Motor & Vibrator Co.; engines, motors and appliances; capital stock, \$25,000.

Dade City, Fla.—Rapid Transit Co.; capital stock, \$10,000; incorporators, W. F. Skinner, Walter Brown, B. Skinner.

Dover, Del.—Hercules Motor Co.; capital stock, \$100,000; incorporators, P. W. Tomlinson, W. P. White, R. W. Tomlinson, G. D. Brown.

Houston, Tex.—Southern Motor Co.; capital stock, \$1,000; incorporators, F. J. Burkey, M. S. Taggart, F. H. Burkey.

Indianapolis, Ind.—Keith-Clark-Vance Co.; capital stock, \$10,000; incorporators, L. H. Keith, J. G. Clark, W. L. Vance.

Joplin, Mo.—A. & W. Motor Sales Co.; capital stock, \$2,000; incorporators, C. H. Miller, J. S. Allington, V. A. Wilber.

Kansas City, Mo.—Palsen Rubber Co.; capital stock, \$26,000; incorporators, C. A. Palsen, M. E. Wilson and G. M. Cowgill.

Kansas City, Mo.—Palsen Rubber Co.; capital stock, \$50,000; incorporators, C. A. Palsen, M. F. Wilson and Guy M. Cowgill.

Los Angeles, Cal.—Langford Auto Parts Co.; capital stock, \$100,000; incorporators, Fred A. Miller, R. W. Konold, Z. M. Konold, W. H. Fuller, R. L. Tebbitt.

Ludington, Mich.—Four Drive Tractor Co., to make motor tractors; capital stock, \$5,000.

Recent Incorporations

Louisville, Ky.—Cherokee Motors Co.; capital stock, \$10,000; incorporators, L. B. Baskett, S. N. Baskett and A. Y. Aydelott.

Lexington, Ky.—Big Four Taxicab Co.; capital stock, \$300,000; incorporators, A. W. T. Davis, E. R. Aker, M. R. Davis.

Los Angeles, Cal.—Norwalk Tire Co.; capital stock, \$15,000; incorporators, L. S. Rounsaville, Gertrude M. Rounsaville, K. Z. Grainger.

Millwaukee, Wis.—Lippow Cycle Co.

Millbrook, N. Y.—W. H. Lyall & Co., general motor car garage and tire business; capital stock, \$50,000; incorporators, C. V. Lyall, F. Bigler, H. B. Vosburgh.

Madison, Wis.—Kentzler-Hortsmier; capital stock, \$10,000; incorporators, A. R. Kentzler, John F. Hortsmier, Milo M. Kentzler.

Millwaukee, Wis.—Lippow Cycle Co.; capital stock, \$10,000; incorporators, Leo Lippow, Minna Lippow, Normal L. Baker.

Minneapolis, Minn.—F. W. VanSant Co.; capital stock, \$50,000; incorporators, F. W. VanSant, C. B. VanSant, R. E. Brown.

New York—Premier Motor Corp.; capital stock, \$2,500,000; to manufacture engines, motors, etc.

Oklahoma City, Okla.—Oklahoma Motor Sales Co.; capital stock, \$10,000; incorporators, T. H. Dunn, W. W. Land, A. E. Long.

Paterson, N. J.—Hughes Garage Co.; capital stock, \$50,000.

Peoria, Ill.—Bulck Motor Co., to manufacture and deal in all kinds of motor vehicles; capital stock, \$15,000; incorporators, A. J. Morris, J. W. Hall, H. A. Clauson, T. E. Clausen.

Pontiac, Mich.—American Forgings & Socket Co.; capital stock, \$100,000; incorporators, W. W. Stoler, Edward Stoler, H. W. Wiley, E. A. Rathbun, E. P. Heaton.

Pittsburgh, Pa.—Time Sales Auto Co.; capital stock, \$20,000; incorporator, F. Caro.

Portland, Me.—E. R. Renson Motor Co.; capital stock, \$150,000.

Sioux City, S. D.—Ohlman Glegg Co.; capital stock, \$50,000; incorporators, J. W. Ohlman, H. E. Shipley, J. P. Blegg.

Sioux Falls, S. D.—Reed Motor Supply Co.; capital stock, \$50,000; incorporators, H. H. Orme, L. F. Reed, E. A. Reed.

Springfield, Ill.—Hanson Auto Co.; capital stock, \$15,000; incorporators, Herman Hansen, Louise Hansen, Mrs. John Hansen.

Spokane, Wash.—John Doran Co.; capital stock, \$10,000; incorporators, John Doran, Harry Twitchell, W. H. Heyman.

Waterville, Wash.—Motor Inn; capital stock, \$1,000; incorporators, Clayton Ward, C. R. Gray, C. B. Craft.

Wooster, O.—J. M. Ginter Motor Co., to deal in motor cars and accessories; capital stock, \$5,000; incorporators, J. M. Ginter, A. I. Ginter, Edith Ginter, L. Yoder, W. J. Mougey.

Zanesville, O.—United Motor Car & Tire Co., to deal in motor cars; capital stock, \$5,000; incorporators, A. W. Sieglaff, Faye Sieglaff, V. M. Gruman, J. A. Kuebel, C. W. Kuebel.